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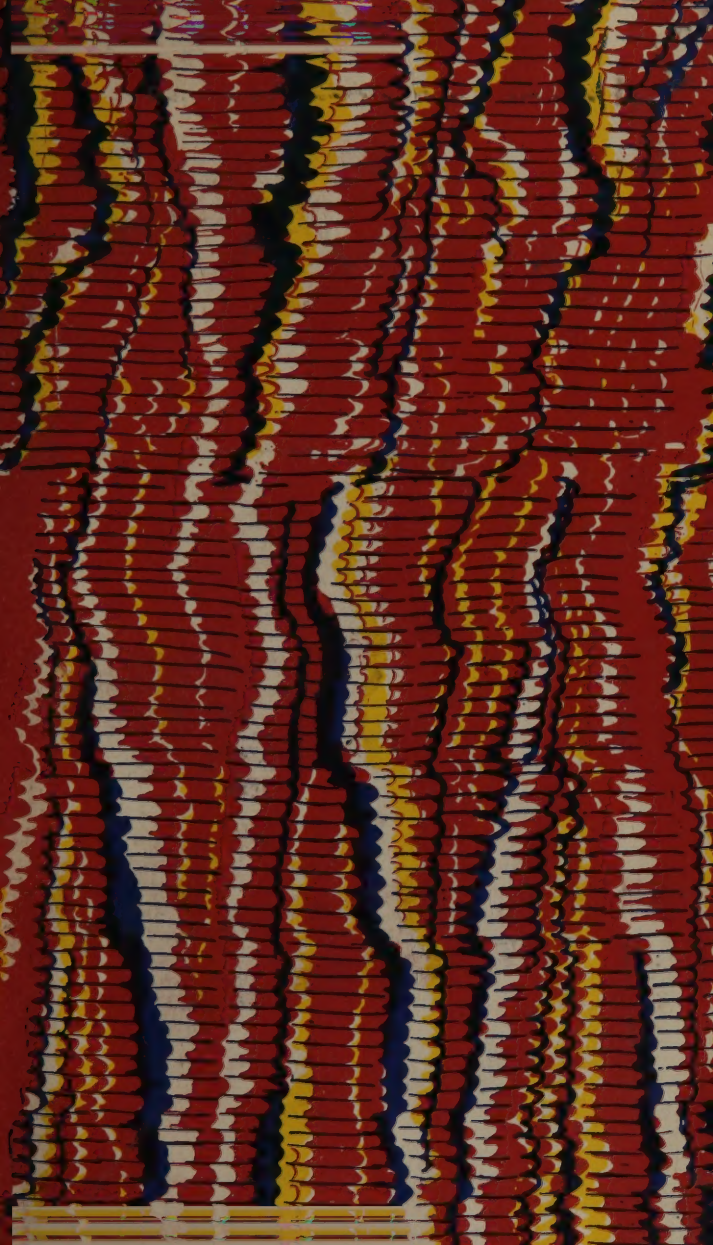
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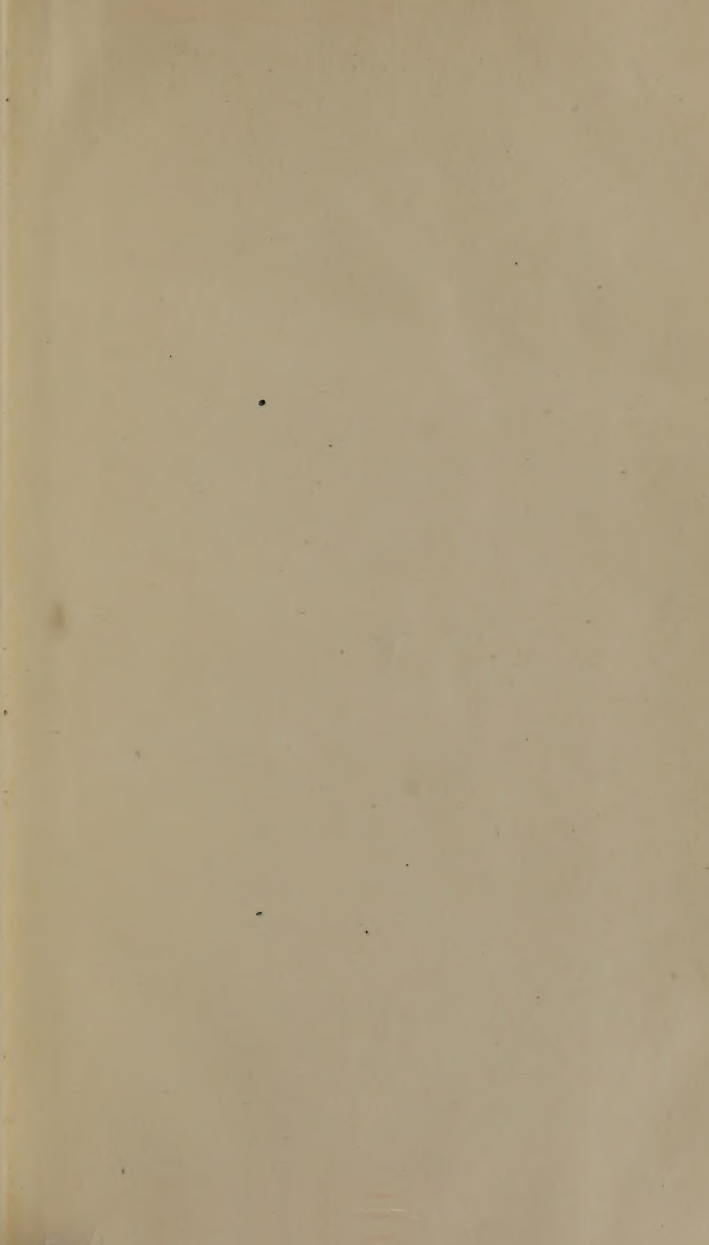
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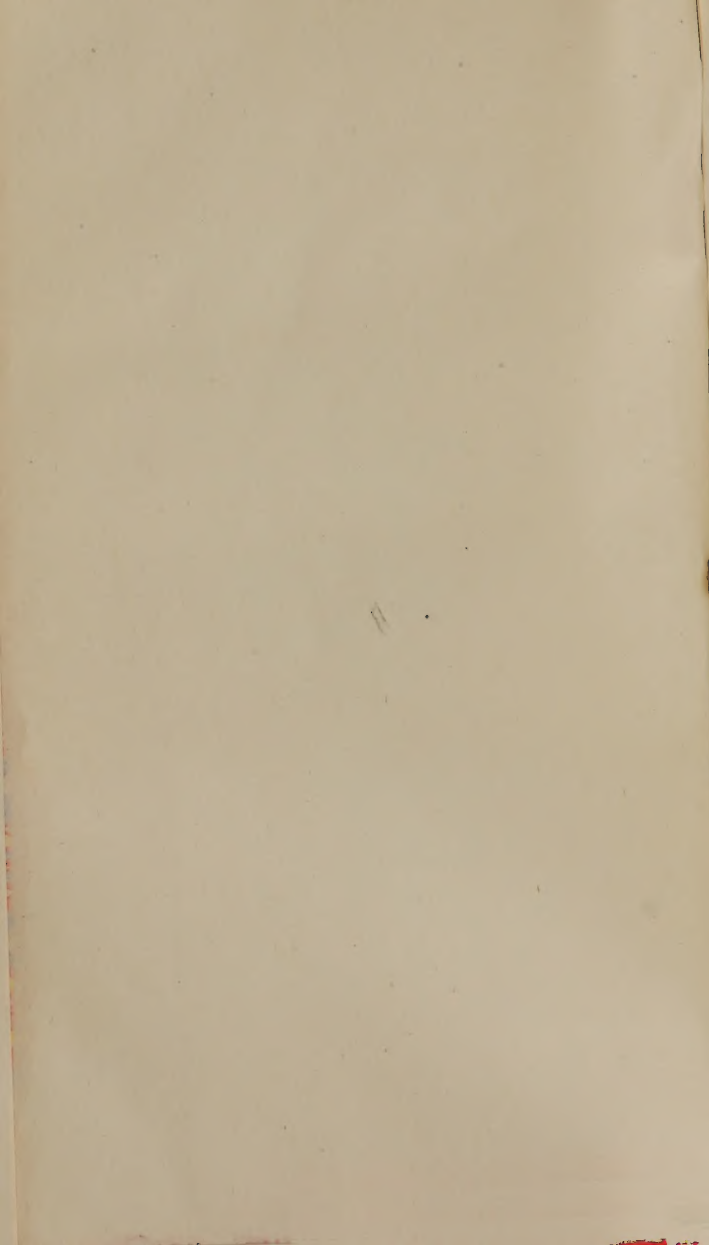
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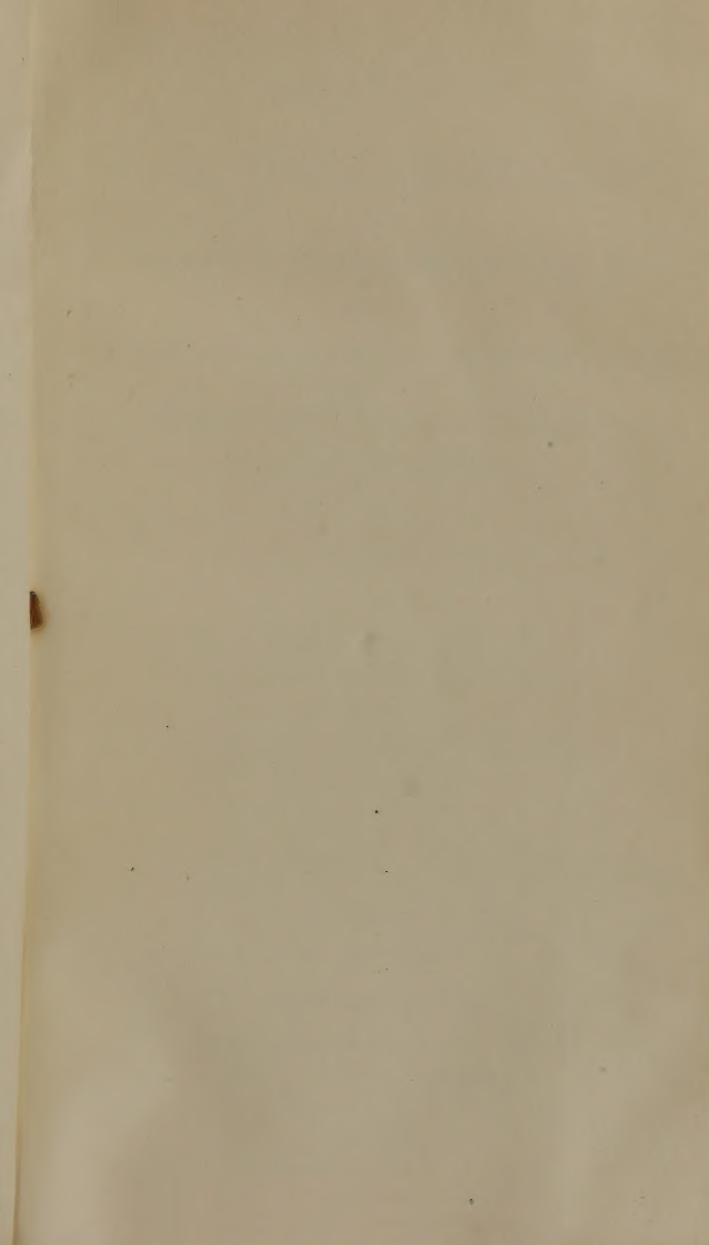
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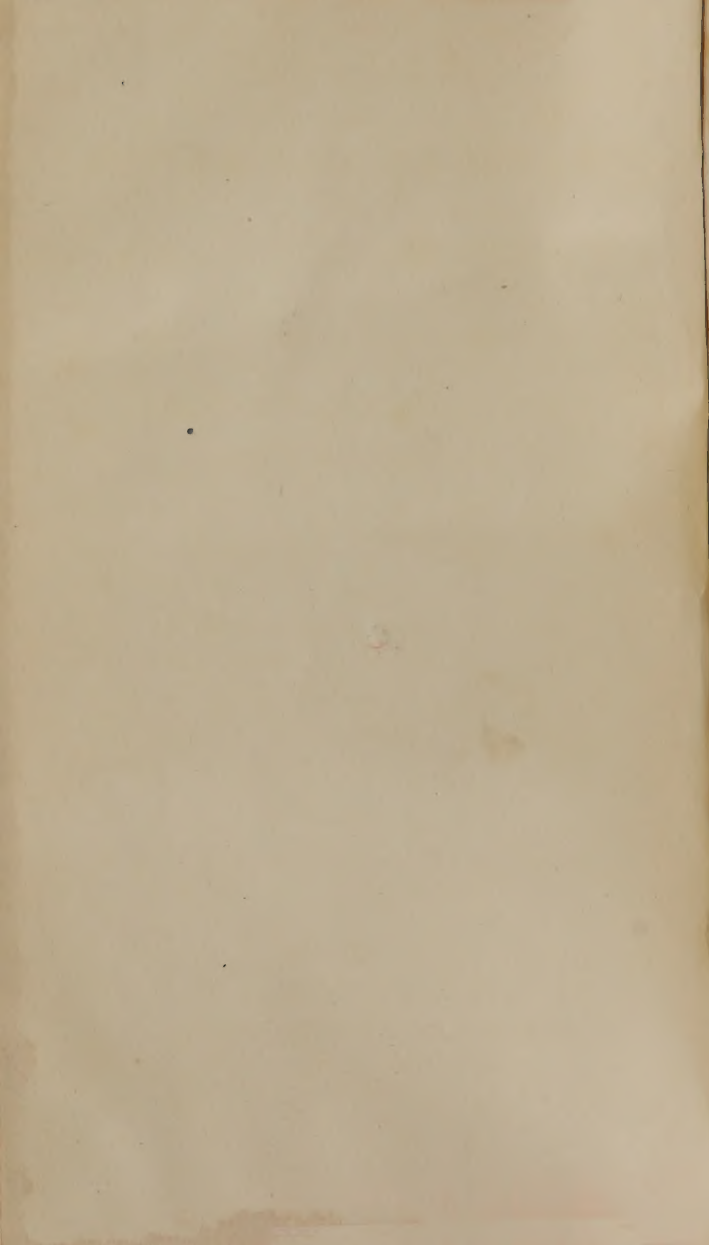
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THE
INFLUENCE
OF
TROPICAL CLIMATES
ON
EUROPEAN CONSTITUTIONS;

BEING A
TREATISE ON THE PRINCIPAL DISEASES INCIDENTAL
TO EUROPEANS IN THE

EAST AND WEST INDIES,
MEDITERRANEAN,

52
G

AND
COAST OF AFRICA.

BY JAMES JOHNSON, M. D.
OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON.

FROM THE THIRD LONDON EDITION,
GREATLY ENLARGED.

IN TWO VOLUMES,
VOL. II.

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1824.

INFLUENCE

TROPICAL CLIMATES

OF TROPICAL CLIMATES

OF THE TROPICAL CLIMATES

EAST AND WEST INDIES

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IN TWO VOLUMES

BY J. C.

PHILADELPHIA

BY J. C.

SKERRETT—LOCUST STREET,
PHILADELPHIA.

MEDITERRANEAN.

General observations on the Climate.

SEC. I.—When we cast an eye along the beautiful shores of this great inland ocean, and survey the classic scenes which present themselves at every step—when we recollect that in peace or in war, the British flag, commercial or belligerent, waves in every port, and off every promontory, from the pillars of Hercules to the shores of the Hellespont, we cannot but acknowledge that the medical topography—the Endemic—and the contagious diseases of this quarter of the globe are not less interesting to Britons than those of either the Eastern or Western Hemisphere. The more intimately we become acquainted with the various climates of the earth we inhabit, the more we shall be convinced that the “balance of comfort” is not so unequally poised as some querulous philosophers imagine. The Eastern world has its *Hepatitis*—the Western its *causus*—the Northern shores of the Mediterranean have their “*pestilential fevers*”—the Southern and Eastern are annually desolated by the *plague*! If “Happy England” knows not these but by report, or in their sequelæ, she every year sacrifices nearly *sixty thousand* of her inhabitants at the altar of *Phthisis*!

In exploring this interesting track, the labours of many must be united in *analytical* concentration; and it is upon this plan, hitherto unattempted, that I hope to condense into one focus, a stronger body of light

ON MEDITERRANEAN DISEASES than has ever yet been collected through a single medium.

Before entering on localities, however, it may not be improper to make a few general observations on this extensive inlet.

Placed between the burning sands of Africa on one side, and the Alps and Pyrenees on the other, the Mediterranean skies are alternately parched by the South-east—chilled by the North-west, or stifled by the sirocco winds. Thus from Barcelona to Genoa, the iron-bound Coast presents a succession of dreary mountains and craggy rocks, the tops of the *former* being frequently covered with snow, from the beginning of March till the end of May. From these the frigid Euroclydons descend in whirlwinds upon the contiguous ocean; while at other times, the sirocco breathes fire from the deserts of Sahara and Lybia. During the continuance of this wind, all nature appears to languish; vegetation withers and dies—the beasts of the field droop; while those who are strongly susceptible to electrical changes in the air, such as precede and attend a thunder storm, will easily understand the effects of the sirocco on the human frame, as an increased degree of the sensations which they then experience. The animal spirits seem too much exhausted to admit of the least bodily exertion, and the spring and elasticity of the air, appear to be lost. The heat exceeds that of the most fervid weather in Spain or Malta. This accession of temperature is rapid—almost instantaneous; and the whole atmosphere feels as if inflamed. The pores of the skin seem at once opened, and all the fibres relaxed. It sometimes blows for several days together, at a medium heat of 112° , depressing the spirits, and so suspending the powers of digestion, that people who venture to eat a hearty supper are generally found dead next morning. Fortunately for animated nature, it is commonly succeeded by the Tramontane or north wind, which,

in a short time, restores the exhausted powers of animal and vegetable life.

After this description, the Mediterranean climate could hardly be set down as one that was favourable to the lungs of a Northern invalid seeking refuge from the atmospherical vicissitudes of England. Yet numerous writers describe this portion of the globe as enjoying a happy medium between intertropical heat and hyperborean cold. But we must not calculate on heat, cold, or evenness of temperature by the parallel of latitude; on the contrary, as a modern author has justly observed, “storms most tremendous occasionally burst from the mountains, with the most piercing coldness, on many of the boasted retreats along the Northern shores of the Mediterranean.” But from words we shall proceed to facts. The following table shows the *comparative* receipt of pulmonic and other diseases into the hospitals of Minorca, Malta, and Gibraltar, from the Mediterranean fleet, during the years 1810—11—12, from official returns :

Diseases.	Malta.	Gibraltar.	Minorca.	Total.
	1810-11-12	1810-11-12	1810-11-12	
Phthisis Pulmonalis	149	187	119	455
Pulmonic Inflammation	52	51	37	140
Fever	747	138	357	1242
Dysentery	36	79	60	175
Total—Phthisis and Pneumonia . .	202	238	156	596
Other Complaints .	883	217	417	1517

Ratio of Pulmonic to the other great complaints, 1 to $2\frac{1}{2}$.

The foregoing table shows only the comparative receipts into hospital of the grand divisions of disease. The rate of mortality is quite another thing. Out of 455 cases of Phthisis alone, 151 died before

the remainder could be shipped off for England, where, in all probability, most of them perished! Whereas out of 1242 cases of fever, only 58 died, and a very small number were invalided. This authentic document will speak volumes on the climate of the Mediterranean. In no other possible way could so fair a calculation be made, as to the *relative* prevalence of complaints, as in a fleet, where the crews of ships are subjected to a similarity of regimen, occupation, clothing, and discipline unknown in civil life, or even in the best regulated army.

That the abrupt vicissitudes of the climate under consideration were extremely productive of pulmonary consumption, the government, and the medical officers of our fleets and hospitals have long been aware; but in private practice, this is little known; and many valuable lives are annually sacrificed by the very means designed to prolong their range.

An ingenious little Thesis has lately been written in Latin by Dr. Sinclair, formerly a surgeon in the Royal Navy, on the Mediterranean Phthisis, from which I shall translate and condense a few passages.

Symptoms.—Dr. S. divides the disease into two stages, the inflammatory and suppurative. The first often advances on the patient with insidious pace, and without giving much alarm:—frequently with symptoms of catarrh, or slight pleurisy, as rigors, heats and chills alternately—thirst—cough—fever. By degrees these symptoms become more marked, and attended with lassitude—pains in the back, loins, and

* Dr. Burnett, while speaking of pneumonia in the Mediterranean, observes that—"He wishes to caution the practitioner against the *insidious form of the milder attack of this disease*, which is but too often considered of little moment—as a catarrh—and the cure entrusted to small doses of antimony and a great coat—often to nature. With pain has he witnessed the effects of this treatment in the *melancholy increase of consumptive cases*, which the summer's heat has brought before him."—*Preface to 1st Edition.*

limbs. To these are occasionally added, nausea, vomiting, head-ache, &c. The pulse is generally from the beginning, quick, hard, and full—sometimes the contrary. Acute pains, more or less severe, now shoot in between the sixth and seventh ribs near the sternum. Sometimes this pain is complained of as deep under the breast bone—quite through to the spine—or stretching to the clavicles, or shoulder bones, with difficulty of breathing. These symptoms will often become suddenly increased, with such oppression about the præcordia, and obstruction of the vital functions as lead to suspicion of inflammation of the heart itself or its coverings. The patient is now harassed with a dry, irritating cough—dyspnœa, and inability to lie down. These symptoms are somewhat mitigated on the appearance of expectoration, which is rarely free, or tinged with blood. In some people, who are biliously inclined, the pain in the right hypochondrium will imitate Hepatitis, till purulent expectoration reveals the true nature of the disease.

The termination is either by resolution—suppuration with ulceration of the worst kind—or effusion.

Resolution.—In this case, the graver symptoms subside before the close of the first septenary period—that is, about the seventh day, the pain ceases—the pulse becomes slow—the expectoration free, whitish, and thick—the skin relaxes into a gentle perspiration—the thirst is assuaged—and the appetite returns. If these salutary events do not take place before the fourteenth day, suppuration is generally the consequence.

Suppuration.—In many cases, although the violence of the disease is mitigated by appropriate remedies; yet a deep-seated, obtuse pain continues obstinately fixed in one side, with a sense of weight there. The difficulty of breathing remains, and the patient cannot lie down. Debility now increases fast—emaciation

takes place—the pulse is easily accelerated—the expectoration from being viscid and frothy, becomes, in a few weeks, opaque, yellow or green. In short, hectic fever is established, and PHTHISIS carries the victim to his grave in the course of five or six months—generally towards the latter end of August or September.*

Post Mortem appearances.—Vomicæ of various dimensions were very often developed. The larger contained from a few ounces to a pint of fœtid, green or yellow pus. In some cases empyema—in others, the lungs were ulcerated—beset with tubercles of different sizes, or entirely destroyed, with only a mass of tubercles remaining—and that too within six weeks after the stage of acute inflammation!

Methodus Medendi.—During the inflammatory period, nothing but the most decisive evacuations from the vascular system will save the structure of the lungs from that dreadful disorganization described above, and which supervenes on inflammation in the lungs in a more rapid manner, here, than in any other climate. Twenty-four or thirty ounces of blood must be immediately abstracted, and this reiterated according to the violence of the disease. Saline cathartics—cool air—cool drink—rigid abstinence—antimonials—blisters, &c. are to be used as secondary means. In these cases, it is not always easy to limit the extent of ulterior venesection. If we bleed *too* far, we risk effusion—if *too* little, suppuration.—This is a most critical and dangerous period of the disease. About the fourth or fifth day we shall apparently have conquered all the more violent symptoms, and the patient will be considered convalescent—but all at once, he is seized with darting pains in the chest—the muscles of respiration are spasmed—and strangulation is threatened by the convulsive cough! Blood must

* Autumnus tabidis malus. Hippoc.

again be drawn, but with caution, for the transition from this state to irremediable effusion is awfully sudden and uncertain. Here local evacuations, and other local means may be beneficially put in requisition.

When PHTHISIS approaches, nothing but a retreat from the Mediterranean before the autumn sets in, can give a shadow of hope or safety to the patient—

Frustra per autumnos nocentem
Corporibus metuemus Austrum. *Hor.*

as has been proved by the *recovery of many invalids*, when sent home, in the autumn, from our fleet. “Non
“alio modo evitari possunt, quam Cœlum salubriori
“mutando ; quod *invalidi plurimi domum e classe nos-*
“tra, in autumnno quotannis remissi, sanescendo, con-
“firmant.” *Thesis, p. 30.*

Dr. Sinclair remarks that as in the months of *January and February*, the air is clear, temperate, and steady in the Mediterranean, they are the only months in which a *phthisical* invalid can safely sojourn on the shores, or navigate the waters of this inland ocean.



MEDITERRANEAN FEVER.

*Analytical Review of Dr. BURNETT's Work on the
Bilious Remittent Fever of the Mediterranean.*

SEC. II.—If the destructive war, which ravaged the world for more than twenty years, has consigned millions to an early grave, it has, like most human events, been productive of good as well as evil. In a medical point of view it has called forth original genius, in combating the maladies to which we are subjected by our emigration or military enterprizes ; and we are much mistaken, if it has not thrown great light on a disease, the nature of which has puzzled the physicians and philosophers of all ages. The awful

forms which FEVER assumes in fleets and armies beneath the burning skies of the East and West Indies, and round the romantic shores of the Mediterranean, gave rise to bold and energetic measures of cure, which never could have originated in the retired paths of private practice. A cursory view of our military and naval medical writings, must clearly evince the truth of this remark. But these innovations were regarded with a dubious eye by our medical brethren at home; and although the host of prejudices engendered in the humoral, spasmodic, and Brunonian Schools are now fast dispersing, it is necessary to give every new *fact*, illustrative of a more rational theory and successful practice, the widest publicity, since the phantoms of "debility and putrescency" continue still to haunt the minds of a very considerable portion of medical practitioners.

The first part of this volume proposes to give "a faithful and practical account of the disease, as it appeared in the ships and hospitals of the Mediterranean fleet."—*Preface*.

Dr. B. states that excepting in one instance, the ships of the fleet enjoyed an exemption from fever during the spring months, and early part of the summer, the disease occurring in its epidemic state, either while the ship was in port refitting, or shortly afterwards. The exception was in *H. M. S. Kent*, where the disease broke out while cruising off Toulon, *three months* after leaving harbour. It is towards the end of June, or beginning of July, that febrile affections present themselves; and the usual symptoms are head-ache, nausea, prostration of strength, suffused eyes, flushed countenance, tongue white and moist, thirst, skin variable, both as to temperature and perspiration. The same may be said of the pulse; but the bowels are generally costive, and the appetite impaired. These are the milder symptoms of the disease in summer; but where the patient has committed

excesses, or been exposed to the sun and night dews, it frequently assumes a severer aspect, resembling the autumnal fever of hot countries. At this time, gastric symptoms are seldom formidable, the head being the organ which principally labours; the relief of which, and intestinal evacuations, are the paramount objects of the practitioner's care.

As the summer advances, the disease is more dangerous. After a sense of lassitude and prostration of strength, a chilliness extending along the spine succeeds; and this is followed by considerable vascular action, accompanied by head-ache, deep-seated pain in the orbits, with sometimes a prominence of the eyeballs, which appear watery, inflamed, and impatient of the light. A flushing, and even tumefaction of the face, extending down towards the breast, are not unusual, with loaded tongue, and bad taste in the mouth. Amongst the usual symptoms may also be enumerated, uneasiness in the epigastric region, nausea, bilious vomiting, pains in the joints and back, and constipation. The pulse is generally full and hard, sometimes oppressed, but rises under the lancet.—Partial perspirations are sometimes observable; but generally the skin is dry, and the temperature increased. Severe rigors sometimes, but not very commonly, precede the hot stage of the disease. In many cases, the disease makes a sudden impression, the patient dropping down in a state of insensibility, while at his usual work. In these cases, reaction soon takes place, with violent determination to the brain.

“During the *winter months*,” says Dr. B. “the morbid affection of the brain is not, at all times, so prominent a symptom,” p. 6.

I have seen *intermittents*, and irregular remittents, the consequence of obstructed viscera, occur at this season; but if vegeto-animal miasmata be the cause of “the bilious remittent,” when aided by atmospheric heat, the winter is an unusual time for such a disease.

Dr. Burnett very justly remarks, that if the fever is not early combated, or if treated as a typhoid affection, the appearances will be very different. The head-ache will be accompanied by stupor, and an indifference to surrounding objects; the eyes will have a duller look than usual, or have a yellow tinge spreading, more or less, rapidly to the neck and body. The tongue will be covered with a thick yellow coat, while it is brown and dry in the middle. The prostration will be considerable; the anxiety and pain in the limbs great; the uneasiness in the epigastric region will be urgent, with bilious vomiting and harassing singultus:

“In the severe attacks,” says he, “about the third day, there is often an appearance of complete remission, but the evening puts an end to the delusion; an exacerbation takes place, with great increase of all the dangerous symptoms. Unhappily, this deceitful period has often been mistaken for a real remission of the symptoms, and tonics and stimulants have been given, with a view to prevent the recurrence of the paroxysm; but vain, indeed, are all such efforts, they serve but to increase the malady,” p. 8. “As the disease advances, the pain and uneasiness about the *epigastric region* continue to increase; there is constant vomiting; considerable pain upon pressure, with restlessness and oppression at the *præcordia*. The abdomen is likewise painful, with frequently thin, black, fœtid, and sometimes gelatinous stools. The suffusion, at first of a bright yellow, now assumes a darker hue,” &c. p. 9.

The symptoms which precede death in this fever, are pretty similar to those observable in the fevers of hotter countries, such as coffee-coloured vomiting, intolerable uneasiness in the epigastric region, hæmorrhages, subsultus tendinum, floccitatio, black encrusted tongue and teeth, sinking of the pulse, cold extremities, and finally death, which terminates the

scene—"frequently on the third or fourth, but generally from the fifth to the eighth day; though sometimes, death is protracted beyond that period," p. 10. Dr. Burnett, contrary to the observations of Cleg-horn, asserts that "in by far the greater number of cases, though there are even exacerbations, there is but seldom any evident and clear remission in the morning.

Under the head of "probable causes," Dr. Burnett traces the influence of marsh miasmata in the fevers which prevail at Minorca, Malta, &c. with many interesting and sensible remarks on the topography of those places. Dr. B. reiterates the sentiments of former writers on the *exciting* causes of this fever, namely, intemperance, exposure to the sun by day, and the dews by night. The young and plethoric are most subject to the disease, particularly the crews of boats, and ships' companies, who have shared much prize-money, and are permitted to spend it on shore, p. 17.

Our author has not been able to detect the agency of contagion in its production, but rationally, we are sure, allows that "in the latter stages of this fever, where proper attention may not have been paid to personal cleanliness, to the removal of the excretions, and to ventilation, where the sick are crowded, the surrounding atmosphere may be vitiated," *ibid.*

Method of Cure.—Dr. Burnett judiciously enough divides the disease into four stages. 1st. From the beginning till the commencement of gastric symptoms or yellow suffusion, a period of about three days. 2d. From this period till the appearance of nervous symptoms, the duration of which is various. 3d. From the accession of these last symptoms, marked by increased uneasiness in the epigastrium, ischuria, singultus, coffee-coloured vomiting, &c. till death or convales-

cence. 4th. From the commencement of convalescence till final recovery.

Our author but too truly observes, that in the first stage of the disease, the prostration of strength, watery eyes, anxiety, syncope on the abstraction of blood, &c. are well calculated to deceive the inexperienced observer.

“Blood-letting, both general and local, should be had recourse to, and repeated, according to the urgency of the symptoms: the benefit derived will be greatly increased by the use of purgatives and free ventilation. It will often happen, after a few ounces of blood have flowed, that syncope will be induced; this must not prevent the repetition of the bleeding, while the symptoms require it,” p. 20.

Dr. B. in imitation of Dr. Irvine, prefers arteriotomy at the temples.

“In the course of an hour, the bleeding may generally be repeated, and thirty or forty ounces may be taken away without producing syncope. In bleeding, the patient should be laid in a horizontal position,” *ibid.*

The purgatives which Dr. Burnett recommends, are those of Dr. Rush, namely, calomel and jalap. He justly remarks, that the oppressed pulse will rise under the lancet, and that an accession of strength is actually obtained by the loss of blood.

“The great object, says Dr. Burnett, is the removal of the local affection of the brain, or other organ, and the production of a complete remission of the febrile symptoms in the least possible time. In one instance, I ordered blood to be taken from the temporal artery, to the amount of ninety ounces in the course of six hours; he was convalescent in three days,” p. 22.

If, notwithstanding all our efforts, the febrile symptoms should continue, Dr. B. recommends in the evening, after a repetition, if necessary, of the bleeding,

a pill composed of calomel and antimonial powder, each two grains, followed by a dose of julep. ammon. acetat. with cool drink, and the most strict antiphlogistic regimen.

In a note at page 34, Dr. B. states, that "it is but justice that I should add, that *some surgeons* thought benefit was derived from the use of calomel in the *first stage*, carried so far as to excite pyalism."

After recommending decisive evacuations from the vascular system and the bowels, during the whole of the first stage, but condemning emetics, Dr. B. proceeds to the second stage, premising, that much confidence must not be placed in cold and tepid affusions, excepting as auxiliaries to the above measures.

In the second stage, he thinks, that where the symptoms indicate the necessity of venesection, it may still be resorted to, though in smaller quantities, and the blood is best drawn from the temporal artery. Blisters to the head, and daily evacuations from the bowels are here proper; but the cathartics should be of the less powerful kind, such as castor oil, assisted by enemas. The irritability of the stomach is to be allayed by the application of leeches, and the exhibition of saline draughts, in a state of effervescence, to which may be added, *small* doses of tinct. opii. The application of a large blister to the stomach has been also attended with success. In this stage, Dr. B. speaks highly of the warm bath, and we entirely coincide with him.

In the third stage, "little more can be done than to look on, and endeavour to obviate occasional symptoms as they occur," p. 29. As the pulse sinks, the stimuli must be increased; and Dr. B. thinks that he has seen much benefit from carbonate of ammonia and aromatic confection, in this dangerous stage of the disease. We must take care, however, while we labour to restore the balance of the circulation, not to induce a state of secondary excitement, and thus

exhaust the flame we were endeavouring to keep alive. Even here, constant attention must be paid to the bowels, and daily evacuations procured. Dr. B. asserts, that the disease has seldom terminated in intermittent, under his own treatment; but frequently under that of others.

“It appeared to be in general, occasioned by some morbid affection of the *brain*, liver, or other viscera,” p. 31.

In these cases, he recommends mercurials till the mouth becomes affected. In the fourth or convalescent stage, the only interesting remark relates to the care we should take, in guarding against a relapse from repletion. While noticing the different remedies which have, in their day, been celebrated in this fever, Dr. B. asserts of cinchona, that, “under its use, mortality has been great, relapse frequent, and, as in the cases of the *Temeraire* and *Invincible*, dysentery attacked nearly all the patients who had had fever in a severe form; nor was there an instance, that when given during a supposed remission of the symptoms, it prevented a return of the paroxysms,” p. 34.

On dissection, the vessels of the brain were generally found distended, and even gorged with blood, while the membranes were inflamed, and the ventricles containing serous effusions. In the thorax, the lungs and other parts were inflamed. In the abdomen, liver generally enlarged, frequently livid towards the lower edge of its concave side. Gall-bladder moderately full of inspissated bile. Stomach generally, more or less inflamed, as also the intestines, p. 37 et seq.

The cases and dissections occupy more than eighty pages of the first part of our Author's work. They more than prove the grand object of Dr. Burnett, and of many judicious writers, who have laid the result of their experience before the public; namely, that the lancet must be boldly used in those fevers,

and in those climates, where the dogmas of the schools, and the timidity of practitioners, had nearly proscribed it. In this point of view, the accumulation of facts will firmly support the rising edifice of a more rational and successful mode of treatment than has formerly been employed, and Dr. Burnett's work therefore, entitles him to the thanks and esteem of the public.

The second part of the work opens with a sketch of the Author's observations and practice in the Mediterranean, while serving on board the *Goliath*, *Diadem*, *Athenienne*, and finally, as physician to the fleet. In the year 1799, a part of the *Goliath*'s crew, that had been employed in watering the ship at *Marsa Scala*, in the Island of Malta, suffered an attack of bilious remittent fever, the prominent symptoms of which were, nausea, vomiting, head-ache, flushed face, full and frequent pulse, thirst, white tongue, and, in most cases delirium.

"The patients were liberally evacuated on their complaining, and the bleeding repeated according to the urgency of the symptoms; an open state of the bowels was preserved, and a mild diaphoresis kept up. Blisters were applied to the nape of the neck and forehead, and a strict antiphlogistic regimen pursued. This soon produced a cessation of the pyrexia, when tonics and a well-regulated diet completed the cure," p. 132.

In the succeeding year forty of the *Diadem*'s crew were similarly affected at Port Mahon, "and so speedily was a remission procured by the free use of the lancet, that I had only occasion to send two or three to the hospital," p. 133. Dr. B. here acknowledges that the use of emetics in a few of the first cases was highly prejudicial, a fact that will be experienced in the fevers of most warm climates. In this fever, small doses of calomel and antimonial powder were given with advantage, after liberal evacuations;

and a simultaneous application of cold water to the head, and warm water to the lower extremities, was productive of beneficial effects, a circumstance that accords with our own experience in fevers of a similar type. In one case, which proved fatal, Dr. Burnett's assistant gave the patient an emetic of tartarized antimony, the consequence of which was, that "the vomiting increased, and never afterward for a moment left him; he passed blood by the nose, mouth, and anus, and finally died in the hospital," p. 134.

Let this prove a lesson against emetics in fevers of the warmer regions, where gastric irritability is one of the most formidable symptoms we have to encounter.

The Athenienne's ship's company having been much exposed to the ardour of a summer sun at Malta, while the vessel was docking and refitting there, was attacked with fever attended by great local determination, "but," says our Author, "by a proper use of the lancet in the *early stage*, joined to purgatives, they all speedily recovered," p. 135.

Shortly after Dr. Burnett was appointed physician to the fleet, in 1810, a fever broke out in the *Achille*, of 74 guns, at Cadiz, which was reported to the admiral, "*to be the yellow fever of the West Indies*, and of a very malignant and infectious nature." This caused great alarm in the squadron; but Dr. B. found that the symptoms were similar to those he had observed in the fevers at Mahon, &c. and that there was great determination to the thoracic viscera in particular. "Emetics, bark, camphor, wine, and opium were employed in the treatment of these patients," which Dr. B. very properly ordered to be laid aside, since two deaths had already occurred; and "the lancet was had recourse to and used freely, and also purgatives; this soon produced a change in the features of this disease, and the whole, except one man, speedily recovered," p. 136.

Dr. Burnett arrived at Gibraltar in September, at which time the garrison was healthy. The thermometer ranged from 75 to 80, and about the 18th or 19th, a deluge of rain fell, and continued three days, the torrents from the upper parts of the rock sweeping down great quantities of putrefying vegetable and animal substances, which lay stagnant with the water in many places where the outlets were not pervious. After this the weather became very warm with easterly winds. In the last three days of the month 26 men, belonging to the St. Juan guard-ship, were sent to the hospital with the bilious remittent fever, four of whom died, none of which had been bled. The general treatment was purgatives, calomel, blisters to the region of the stomach, and gentle diaphoretics. The cold affusion was also tried, and proved useful.

From Mahon Dr. Burnett proceeded to Sicily, where he found that experience had already pointed out the necessity of evacuations when DEBILITY was the most prominent symptom, as is evinced in the communications from Dr. Ross, of the Warrior, and others. The army practitioners had, indeed adopted the most decisive depletory measures among the troops in Sicily, previously to this period, as our readers know, from the writings of Irvine and Boyle; but in the navy it was only slowly introduced, and we believe Dr. B. met with some difficulties, which, however, his zeal surmounted, in banishing from the minds of the medical gentlemen under his control, the phantom *debility*, and the delusive theories of the schools.

There is one circumstance which I have not yet noticed, though it has made a deep impression on my mind, namely, that throughout the descriptions which are given of this "*bilious remittent fever*," by Dr. Burnett and his numerous correspondents, no mention whatever is made of either diurnal or alternate *remissions*; excepting in the Temeraire and Invinci-

ble; and I cannot help expressing my suspicion, that a great proportion of the cases were fevers occasioned by atmospherical transitions and irregularities, rather than by the application of vegeto-animal miasmata; and that consequently, they were attended with more marked inflammatory symptoms, and assumed a less remittent type, than the fevers under whose denomination they are classed. Perhaps the term "bilious fever," (gastric irritability being so very general,) would be more proper; and where the cause can be clearly traced to the operation of marsh miasmata, the epithet "remittent" might be properly added, because it is rare indeed that remissions on alternate days in particular, cannot be distinctly perceived. I have offered these suggestions because I am of opinion that some modification of the practice detailed by the author, is necessary in the more fatal endemics of the warmer climates, where that wonderful and powerful morbid cause—"marsh miasma," attains a state of concentration unknown in Northern latitudes. In the Temeraire and Invincible, where the fever was evidently the bilious remittent of hot climates, the treatment was founded on the directions of Lind, Clarke, and Balfour, whose works continue still to produce incalculable mischief in the hands of inexperienced practitioners. But the more rational and successful doctrines and practices which have lately been promulgated by judicious medical men, both in the army, and navy, will dissipate, ere long, the mists of prejudice, and annually save the lives of thousands of our countrymen. We have only to read the melancholy account of the fever in the two ships above-mentioned, to be convinced of these truths.

"On making inquiry, says Dr. B. as to the method of treatment which had been pursued with those men, I found it to have been by the use of *emetics*, calomel, antimony, *bark and wine in large quantities*, with full meals of animal food from the beginning, p. 158.

I hardly know how a surgeon could prescribe, or a patient take, "full meals of animal food," in a violent and acute fever, where all appetite is almost invariably destroyed. But the medicines were quite sufficient to produce the fatal catastrophe which followed. Those who did not fall immediate sacrifices, "were constantly relapsing; several as frequently as three times, most of them once, and some of them were daily attacked with dysentery," p. 159. This was not all; for the visceral derangements induced by these protracted and repeated attacks incapacitated them in great numbers for the service of their country, and left them to drag out a miserable existence in indigence and disease! Such are the fruits of adhering to Brunonian theories, and the doctrines of debility and putrescency, taught with such complacency and importance "in academic bowers and learned halls."

I have hinted that certain modifications of the treatment pursued by our author, would be necessary in the bilious remittent fevers of warmer climates, and the reason is obvious; although in the Mediterranean the range of the thermometer equals at certain seasons the scale of tropical temperature, yet there is not that perennial ardor which, in equatorial regions, keeps the functions of the liver in so deranged a state as to render that organ peculiarly predisposed to disease, when the balance of the circulation is violently disturbed, as in remittent and intermittent fevers. On this account, liberal evacuations in the early stages of Mediterranean fevers, and slight tonics or bitters afterwards, are in general sufficient to conduct to a happy termination: whereas, in other and hotter regions, particularly in India, the use of *mercury*, in addition to the means alluded to, is absolutely requisite to secure the biliary organs from obstruction or abscess.

"In the Repulse," says Dr. B. "Mr. Boyd reports that he had been very successful in combating it, [the

fever,] by the early use of the lancet and purgatives; cold and tepid affusion he likewise found serviceable, as auxiliaries. In some cases, copious and sudden affusion produced a diminution of febrile heat, sweats, and a remission. In *several* of the patients, he mentions *calomel* as having had *very excellent effects*. In one case of *great danger*, benefit appeared to be derived from the inunction of *mercurial ointment* on the epigastric region," p. 149.*

I have already stated my doubts respecting the propriety of classing all Mediterranean fevers under the head of "*bilious remittent*," as our author has done, and my belief that a great many of them occurred totally independent of marsh miasmata. The following extracts will support this opinion. Mr. Allen, Surgeon of the hospital at Malta, after describing the general symptoms of a fever which broke out on board the *Pomone*, and remarking, that "*The head and liver seemed to be the principal viscera affected in this fever*," goes on thus: "*The Weazle sloop, refitting at the dock-yard, has also sent us about thirty, with similar symptoms to the Pomone's. Our method of treatment has been, in the first instance, by the abstraction of thirty ounces of blood, the exhibition of a cathartic, and a bolus composed of calomel and antimonial powder, of each two grains, twice a-day; the mist. salin. In the evening, the bleeding, if necessary, was repeated. Next day, if the symptoms required it, recourse was again had to abstraction of blood, a blister applied to the epigastric region, and the febrifuge medicines continued. I consider this fever to have been brought on by intemperance and exposure to heat, constituting the bilious or yellow fever of the island. It is not contagious*," p. 168.

In a subsequent fever, in the *Weazle*, Mr. Ward-

* See Dr. Denmark's Paper on the Mediterranean Fever in the *Medico-Chirurgical Transactions*, and Dr. Boyd's Paper on the *Minorca Fever* in a subsequent section.

law, whom our author highly eulogises for his abilities, and whose statement consequently deserves attention, reports thus: "The state of the weather for these six weeks past has been extremely warm; the thermometer ranging from 80 to 87 in the shade. The Weazle arrived at Malta in the month of June, and went up to the dock-yard to refit; the ship's company were then perfectly healthy. Liberty being given to go on shore, and they having received a considerable share of prize-money, intemperance was the consequence; and next day, while very much debilitated, their duty necessarily exposed them to the heat of the sun. On the first attack, I took away from 20 to 30 ounces of blood, with saline draughts and cathartics, a bolus of calomel and antimonial powder, of each two grains twice a-day, *till the mouth was slightly affected*, generally completed the cure. 'The liver and brain seemed to be the only viscera affected; the liver from obstructed ducts, and the brain from the great determination of blood to it,' p. 170.

The remainder of the second part of Dr. Burnett's work is occupied in sketching the fevers of different ships, and stating the reports of their surgeons on the method of treatment, which entirely corresponded with what I have detailed in the foregoing pages. Bleeding, purging, and the exhibition of mercury were the prominent items in the "*Methodus Medendi*," and will, I am convinced, triumph over the boasted list of stimulant, antiseptic, and febrifuge remedies, so long imposed on the credulity of mankind by the fetters of prejudice, and the bigotry of preconceived theories.

When the gates of Janus shall once more be thrown open, and the scourge of war, (which heaven avert!) be again suspended over the restless nations of the world, the medical officers of our fleets and armies will profit by the labours of the present race; and the

bold energetic measures of modern practitioners in the West, in the East, and in the North, will be remembered and imitated, when the authors who practised and promulgated these tenets shall have mouldered in the dust!

THE MINORCA FEVER;

Translated and condensed from a Latin Thesis,

WRITTEN BY DR. WILLIAM BOYD,

(Formerly Surgeon of Mahon Hospital.)

Entitled—DE FEBRE MINORCÆ, &c.—1817.

SEC. III.—Although Dr. Boyd did not meet with this fever under the *remittent* type, as described by Dr. Cleghorn, yet he considers it as only differing in *grade* from the marsh or bilious remittent of that and other authors. It is produced by the same causes—appears in similar places—affects the same organs—proves fatal to the same classes of people; and only differs in consequence of atmospherical influences, and a greater intensity of force in the remote and predisposing causes.

This fever could be clearly traced to a *local* origin in Port Mahon; and was therefore not contagious, but a primary and idiopathic disease; assuming the *epidemic* character only from the state of the air, and the crowding of the sick. In spring, therefore, it appeared in its simple form. But these fevers, in various instances, *acquired* a contagious quality—that is, the power of propagating themselves from one individual to another. “*In casibus variis vim contagiosam haud raro acquirunt: id est, vim gignendi pro-*

pagandi quoque eundem morbum ab alio ad aliud corpus," p. 3.*

Symptomatology.—The first symptom was a sensation of cold, which crept along the spine, and over the lumbar region. To this succeeded head-ache, generally confined to the forehead, temples, and orbits. The face became flushed and tumid—the eyes inflamed and suffused with tears—the carotids and temporals pulsated violently. The countenance now became entirely changed, and in a manner not to be described in words; while the patient betrayed great anxiety, restlessness—dyspnœa, with sometimes pain and sense of tightness in the chest, cough, inappetency—lassitude—thirst, and watching. The tongue is now whitish or yellowish; but for the most part moist, with a bitter taste in the mouth. The heart beats with great strength against the ribs—all the tangible arteries feel hard and full—and a soreness in the flesh is complained of all over the body. The epigastric region is now very tender; and there is nausea with bilious vomiting. Pains assail the loins—stretch down the thighs, and ultimately affect every joint and member. The bowels are obstinately constive. As the disease advances, the pulse feels less full, and is often weaker than in health; while the thirst and anxiety are aggravated. At this period, the superior parts of the body will sometimes be covered with a profuse sweat, while the skin underneath shall feel burning and rigid. If the fever proceeds, the hot stages are generally, but not always, preceded by rigors.

When the patient neglects himself for one or two

*Dr. Denmark, Physician to the Fleet, who was at Mahon during the prevalence of this fever, and who declares that he was a non-contagionist, observes—"These occurrences, however, served to stagger our belief; and a combination of subsequent events has conspired to make me a convert to the opposite side of the question."—*Med. Chir. Trans.* vol. vi.

days after the first attack; or if the treatment have been inefficient or improper, then a very different train of symptoms takes place. Together with stupor, there will also be great pain in the head—a disinclination to answer questions—and an insensibility, or at least inattention to passing occurrences. The eyes will be more turbid—often inflamed. A yellow tinge will cover the adnata, and suddenly spread to the face and neck, and thence over the whole surface of the body, in less than twenty-four hours. The tongue now exhibits a thick yellow crust—brownish and dry towards the middle—red and inflamed at the sides. The strength becomes remarkably diminished—the stomach is harassed with nausea and bilious vomiting—the heart beats less strongly, and more quickly—the countenance is collapsed, and the red tints unequally scattered over it.

After several accessions, and about the third day, these symptoms are suddenly and signally mitigated—the skin comes nearly to its natural temperature—the fever disappears, and nothing but debility apparently remains. But in a short time, an exacerbation supervenes. The disease acquires a renovated force, and shows itself under quite a different aspect. A new train of symptoms assail, with the greatest violence, the epigastric region. The sense of anxiety at the precordia is now changed into acute pain, which is greatly aggravated by pressure—the redness of the eyes changes into yellowness—the countenance is sunk—the tongue is brown, and trembles immoderately when attempted to be thrust out—the pulse is rapid and weak—all desire for food or drink vanishes—there is perpetual vomiting of putrid bile—the precordia are exceedingly oppressed—the patient sighs frequently—the stools are liquid—fœtid—slimy, and often bloody. The whole body is now of an intensely yellow colour, [*totum corpus alte flavescit.*]—and emits a fœtor resembling that of putrid bile. The

patient's mind is now completely collected, and he answers questions with promptness and clearness—sometimes there is a little aberration, or negligence of surrounding circumstances. From this time, that is to say, from the 5th till the 7th day, the patient is harassed with a train of nervous symptoms, as sub-sultus tendinum, tremors of the whole body, &c. which tend to exhaust the strength. With pain in the abdomen, there is difficulty of swallowing, and a sense of ulceration in the fauces, with vomiting of a glairy, or black matter resembling the *grounds of coffee*. [Nec non vomitus materiæ glutinosæ nigræque, *fecibus choaræ* similis.] Pain about the pubes, an inability to make water—a dangerous symptom.*

In many cases, we observed swelling and suppuration of the parotid glands, with petechiæ before death. In others, there were discharges of blood from the nostrils, gums, fauces, &c. In others still, instead of gastric irritability, we had diarrhœa, with discharges of black fluid, which occasioned great tormina, and rapidly prostrated the patient's strength. The face, which lately exhibited a yellowish or livid appearance, now became tumefied—the eyes lost all expression, and became glassy—the pupils dilated—clammy sweats broke out unequally over the body—the tongue and gums turned quite black—the breathing became more difficult—the anxiety more distressing. From this time, coma or delirium, with coldness of the extremities and intermitting pulse took place; and convulsions terminated the scene, from the 5th till

* The above authentic document drawn up by a gentleman of great talent and observation, at the bed side of sickness, must remove all doubt relative to the existence of yellow fever in the Mediterranean; while the Section on Endemic of Batavia must have convinced the most sceptical that the same disease appears in the Eastern world, modified of course by climate, constitution and cause. Compare this description with Mr. Amiel's account of the Gibraltar Fever.

the 8th day—sometimes sooner, sometimes later than this period.

All the above symptoms were not apparent in the same person, nor ran an equally rapid course. In the young, strong and plethoric, the march was more violent and hurried—in the elderly and enfeebled the disease was infinitely milder.—Turbid urine letting fall a copious sediment—discharge of bilious stools, at first black, afterwards yellow and copious, were favourable symptoms. When the disease continued beyond the usual time, and especially if the skin kept its yellow tinge, the liver was almost always affected. Relapses were not unfrequent, particularly if great attention was not paid to a restricted diet during convalescence.

Ætiology.—*Intense heat*, which during the summer months prevail without intermission in Mahon harbour, where a breeze seldom ruffles the surface of the water—violent exercise in the open sun—Intemperance of every kind, in which sailors, on getting ashore, so unguardedly indulge—exposure to the night, or to dews, wet, or cold, after the body had been heated; these were the principal exciting causes that gave activity to VEGETO-ANIMAL EXHALATIONS which issue in profusion from the harbour and vicinity of MAHON.

This port, so destructive to the health of belligerent seamen, is situated low, and the surrounding sea is so tranquil, and the tides so imperceptible, that whatever is thrown into the water remains almost always in the same spot. Now when we consider the quantities of putrefying animal and vegetable substances that are daily launched into the harbour, or exposed to a tropical heat on its shores; and couple these circumstances with the *stagnant* state of the water itself, during the summer and autumn months; and moreover, when we observe a pretty extensive lake in the vicinity of the port, which, in winter, is

filled by rains and springs, but in summer exposes its half-dried, slimy bottom to the sun, whence pestiferous effluvia incessantly emanate, [prope portum adest lacus, cui hieme ex aquis pulvis ac fontanis, constat; sed estate fere arescit, et limosam massam putrescentem relinquit, ex qua pestifera effluvia haud cessant emanare,] we cannot be at a loss for the generation of those *morbific miasms*, which, in all hot climates and similar situations, give origin to fevers analogous to the one under consideration.

Prognosis: Favourable.—Little, or only mucous vomiting at the beginning of the second stage—moist skin—slow advance of the yellow suffusion—bowels becoming loose, with bilious stools—integrity of the nervous system and its functions.

Unfavourable.—Early accession of the yellow suffusion—deepness of its tint—early disturbance of the sensorial functions—deep redness of the face—dullness of the eyes—laborious respiration—feeble, creeping, and intermitting pulse—difficulty of swallowing—great tremour of the tongue—involuntary discharge of fœces, especially of a black, liquid quality—incessant vomiting of dark-coloured matters and great in proportion to the fluid swallowed—much anxiety.

Post Mortem Appearances.—The vessels of the brain much distended—coverings not rarely inflamed—depositions of coagulable lymph between the convolutions—adhesions occasionally between the hemispheres—ventricles sometimes distended with lymph or yellow lymph—*lungs* sometimes inflamed, with adhesions or effusions—pericardium inflamed with more than usual water in its cavity. Diaphragm often inflamed, with coats of coagulable lymph. Liver, in most instances, enlarged—often inflamed, with its inferior margin livid—Gall-bladder distended with viscid bile. Stomach and intestines often inflamed, and the villous coat of a dark colour.

These appearances, like the symptoms, were not all

found in the same person, or together. In some dissections we found one set of organs, in others another, bearing the marks of disorganizing action. In general, however, the brain and lungs seemed to bear the greatest onus of disease.

Consilia Medendi.—The disease naturally divided itself into two stages—the first of reaction; the second of collapse. In the first stage the object was to moderate or repress the violence of reaction; in the second, to obviate symptoms, and support the energies of nature.

1st Stage.—Venesection is here our sheet anchor. No man can lay down a rule of *quantity*. Blood must be drawn till the symptoms are signally mitigated, whether at twice, thrice, or four times in the day. I do not think it of much consequence from what part of the body the blood be drawn. Some prefer the arm, some the jugular vein, others the temporal artery. To alleviate the head-ache, I think I have found arteriotomy at the temples most powerful. But the vascular system must be promptly, and well depleted, through whatever outlet the current flows, otherwise some texture or organization will give way, and then the chances of recovery are faint indeed.

Mean time the head is to be shaved, and kept constantly enveloped with cloths wetted with the coldest water. This is an important measure, which should never be neglected. In my own person I experienced its good effects, in soothing the pain—diminishing the heat—and tranquillizing the irritability of the system.*

Purgatives. Our next step is to open the bowels, which indeed must be done through the whole course of the disease. For this purpose, and also to correct

* Dr. Boyd nearly perished under this fever himself; but was saved by profuse bleeding. Dr. Denmark states that Dr. B. caught the fever from one of his patients. *Med. Chir. Trans. vol. vi. p. 301.*

the vitiated secretions of the intestinal canal and liver, I have exhibited eight or ten grains of calomel every four hours, without ever observing any bad consequences from hypercatharsis. In every case where ptyalism came on, the patient convalesced—the stools became natural, and the tongue clean—“*In omni casu in quo (hyd-submur) salivam movit, æger plerumque convaluit, naturales fiunt fœces, lingua nitida, ac humida.*” A cooling regimen is, of course, to be rigidly observed. The cold affusions and spongings are also valuable auxiliaries; and where the reaction is not in a salutary degree, and the interior organs appear oppressed—tepid affusions will be necessary.

To relieve local symptoms—leeches to the temples, or cupping may be employed when general bleeding dare not be ventured on. Blisters also to the head—neck—spine—or precordial region must be had recourse to. In cases of great collapse and deficiency of the *vis vitæ*, the tepid bath will prove an important measure in drawing the circulation to the surface. The abdomen and extremities may also be fomented often as a substitute, or auxiliary to the bath.

Finally, when all danger of inflammation or congestion is over—and where great irritability of the heart and nervous system prevails, opiates may be administered, and with great solace to the feelings of the patient.

In the *second* stage, the great difficulty is to restrain the vomiting. Fomentations to the epigastric region are here useful, with opium, æther, and camphor internally—to which means must be added blisters. Effervescing draughts with small doses of tinct. opii. ether, infusion of columba, may be tried, and even hot wine with spices—or brandy and water. Glysters with laudanum will sometimes restrain the gastric irritability; and I have frequently given, where the strength was much exhausted, 30 or 40 drops of spirit of turpentine every two hours, with great advantage. Where stimulants are necessary at the close of

the disease, port wine cautiously administered is the most grateful. Quassia and porter in small quantities during convalescence. But a constant attention should be paid lest the patient take too much food, which will readily induce a relapse.

I shall conclude this section with a few short extracts from Dr. Denmark's paper on the same fever. "A case of this fever will seldom occur wherein the use of the lancet, more or less, will not be applicable. But this powerful remedy is not in all cases infallible. The danger consists in either applying it too late, or too often; and the abstraction of blood, under my own direction, has accelerated the patient's death, when circumstances seemed to justify the measure."

"I shall now say a few words on Mercury, our "sheet-anchor" in affections where the biliary organs are implicated. Viewed in any way, the utility of mercury is incontrovertible. Calomel is beneficial in whatever way it operates. Whether it produce catharsis, when exhibited with a view to salivate; or salivate, when intended to act as a cathartic, the result, in either case, will be salutary, though perhaps not to the same extent. I have prescribed it in various forms, in order to fulfil both these intentions, and the result has enabled me to speak most favourably of it. I have frequently recommended calomel in three grain doses, with as much pulv. antim. every three or four hours. The antimony seemed to assist the purgative operation of the calomel, and seldom failed to procure copious bilious stools, without creating nausea. In the treatment of this fever, however, I usually gave the calomel in *scruple doses* twice a-day, in many cases from the first invasion of the complaint, with the intention of speedily attacking the disease, through the system. But in this I commonly failed during the first days, in plethoric habits. Before the system was lowered, it evinced no effect through the medium of the circulation—it only kept the bowels clear. But after the lapse of two or three days, and

the use of free venesection and purging; and at an earlier period in debilitated subjects, and in cases of relapse, the mouth often became suddenly sore with profuse ptyalism, and rapid convalescence as certainly ensued. I do not recollect any deaths after the specific action of the mercury showed itself; nor did the yellow suffusion occur after this symptom appeared." *Med. Chir. Trans. vol. vi. p. 307.*

I trust that this document will prove a standard record and faithful picture of the MINORCA FEVER, as long as that Island offers a commercial port, or belligerent rendezvous to the naval flag of Great Britain.

SICILY.

SEC. IV.—The climate of Sicily is always oppressively hot in summer, and seldom very cold in winter. Between April and August there is little or no rain; towards the end of the latter month, the rains begin, but the heat continues till the middle of September, when it rapidly declines. From November till May, the heat is moderate, the mercury ranging from 50 up to 65 or 70°. In the summer months, and particularly in July and August, the thermometer averages 86 in the day, and is but a very few degrees less in the night. Sudden vicissitudes of temperature, however, are considerable—20 or 30 degrees in the twenty-four hours. Of course, local inflammations and congestions are common, and *phthisis pulmonalis* is frequently fatal.* Here, as in most hot climates, the houses are more calculated for counteracting heat, than resisting cold, or preserving an equilibrium of temperature. Stone floors and unfinished casements

* Hepatitis, according to the testimony of Irvine, frequently occurs in Sicily.

ill suit the delicate frames of the consumptive in winter; while in summer, the sensation of heat is so great, that many expose themselves to dangerous transitions rather than bear excessive warmth within doors. It is in this way, that many refer the origin of their pulmonary complaints to the most fervid season of the year. *Light* rains in autumn are observed to be unhealthy—evidently from their putting the surface of the earth in a state capable of evolving febrific effluvia; whereas, nothing is so salutary as *heavy* rains about the middle of September, which at once mitigate the heat and check the extrication of miasmata.

Sicily is penetrated in several directions by ridges of primitive hills of considerable height: between these are numerous water courses, which are dry in summer, and occasionally filled by torrents in winter. They are designated by the Sicilians, FIUMARI, and are used as roads in the dry season. Many of them are extremely unhealthy in the latter part of summer, and in autumn, and infested by what the natives term MALARIA. The state of this *Malaria* varies much according to the state of the season. A very wet season will *overwhelm*, as it were, the sources of this febrific; while a very dry one will so parch up the surface of the earth as to produce a similar effect. At LENTINI, however, around which, the country is marshy, with a considerable lake in the vicinity, the ground is *partly* freed from water in hot weather, but is never so dry as to prevent the formation of miasmata. Here then is a *Malaria* every year. In many of the *fumares* the stream disappears in the gravel, and percolates under the surface to the ocean. Thus at the bottom of the large *fumare* which bounds Messina on the northern side, fresh water will be found at a foot depth close to the sea. It is in these kinds of *fumares* that a *Malaria* prevails, according to the opinion of the natives,

throughout the year; and this probably accounts for the extrication of miasmata in many parts of the West Indies as well as Europe, where there are apparently no materials for their production. Thus some places in Sicily, though on very high ground, are sickly; as Ibesso or Gesso, about eight miles from Messina, situated upon some *secondary* mountains lying on the side of the primitive ridge which runs northward towards the Faro, which has always been found an unhealthy quarter for English troops. It stands very high; but still there is higher ground at some miles distance. Water is scarce here, and there is nothing like a marsh.—At this station, however, sickness seldom occurs “unless after rains falling while the ground is yet hot, which is during the heat of summer, or early in autumn, when all circumstances combine for the production of miasmata.” *Irvine* p. 6. This may apply in elucidation of the Gibraltar fever. “I remember, says Dr. Irvine, a muleteer passing over the hills near Obessa, in the middle of August, during a heavy rain, who remarked that these rains falling on the heated ground would cause a stink, (*puzza*,) and that many would be poisoned.” *Ib.*

In Sicily the north wind is cold—the west rainy—the south-east is the celebrated Sirocco, which seems to derive its noxious qualities from heat combined with dampness.—Here, as in most sultry latitudes, the summer and autumn are the unhealthy seasons.

The fevers of Sicily have been divided into three classes, those of summer, autumn, and winter. Those of summer have appeared to Irvine, Boyle, and others, to be of an inflammatory nature—to be principally owing to excessive heat—intemperance, and inordinate exercise. The head seems to bear the onus of disease. Dr. Irvine bled from the temporal artery, repeating the operation *pro re nata*. Blisters were applied to the head, and purgatives were administer-

ed internally. The cold affusion was then applied on the principles of Dr. Currie. "I never, says Dr. Irvine, in any one instance, saw the bleeding fail to remove the pain of the head, and when delirium was present, it lessened also that," p. 24. Encouraged by the alleviations of the symptoms, I persisted in my plan. I bled a third time from the head, and blistered again between the scapulæ, continuing the cold affusion. The number of times that this treatment was repeated was necessarily regulated by the effect produced. I never had occasion, however, to bleed more than four times. But the standard rule of my practice was to continue the bleeding and blistering of the head while any degree of head-ache remained, or any symptom of determination to the head was visible." *Ib.* Dr. Irvine found the bleeding pave the way for, and render more efficacious the cold affusion, which when applied without this preliminary, afforded only transient relief.

"The appearances on dissection were somewhat various. In some cases, nothing very remarkable could be, or was discovered in the brain or its membranes. In others the cerebral veins were turgid with blood. In many there was a red spot on the dura mater, about the middle of the longitudinal sinus, of the size of a dollar. Sometimes a little pus, or rather inflammatory exudation appeared upon this spot." *Irvine*, p. 36.—"I find it difficult, says Dr. Irvine, to reconcile the facts here stated, with the ingenious opinion of Dr. Clutterbuck. I do not think that phrenitis, or any analogous disorder of the brain, often, far less always, exists in fevers," p. 62.

In the autumnal fevers of Sicily, a great many, when the disease was violent "became excessively yellow" without any alleviation of their disorder. The stomach is more irritable—the vomiting is bilious, and of a dark-green colour—the region of the liver sometimes tender. These run out to a much

greater length than the summer fevers, but only differ from them in being accompanied with earlier prostration of strength." "I can safely state, says Dr. Irvine, that the same sort of treatment which I have used in the summer fever, also proved successful in these," 45. Purging, however, was more necessary, and calomel and James's powder were found useful in protracted cases. "Touching the mouth with mercury is sometimes useful in cases where the yellowness is great," 47.

The winter fevers, according to Irvine, had nothing remarkable in their phenomena or progress; but ran a course analogous to the ordinary cases of Synochus in England. "They hardly ever fail to yield to the four grand means of topical bleeding, [arteriotomy,] blistering—cold affusion, and purging," 60.

To the above observations by Dr. Irvine, which appear, on the whole, judicious and correct, I shall add some from the pen of Mr. Boyle, who, in my opinion, has given a more rational explanation of the symptoms, while his *Methodus Medendi* is equally effective as Dr. Irvine's.

When the epidemic first appears, says Mr. Boyle, in the early part of autumn, the fever preserves nearly a continued form, and only remits after the violence of the excitement has been subdued. It bears a strong analogy to the bilious remittents of all warm climates—is closely allied to the fever which visits other points of the Mediterranean shores, and seems to differ only in degree from those great endemics which have repeatedly ravaged the western hemisphere.

"In Sicily, says Mr. Boyle, this fever usually makes its appearance about the same time that cholera morbus and other disorders of the biliary organs are known to prevail, and both diseases seem to arise from causes of nearly a similar nature. It indeed appears to be essential to the production of this fever that a considerable diminution of temperature, accom-

panied with much humidity of the atmosphere, should suddenly succeed to the long-continued heat of summer. By those causes, an important change is effected in the *balance of the circulation*, causing an unusual determination to the abdominal viscera, and producing congestion or inflammation of the hepatic system, in various degrees, followed by an increased and vitiated secretion of bile.* *Ed. Jour. vol. viii. 184.**

The succession and order of the symptoms, marking the different stages and types of this fever, will be readily explained by the appearances on dissection, and seem to depend chiefly on the degree of inflammation, and the sensibility of the part concerned. When the liver is very violently affected, the symptoms sometimes even resemble those of hepatitis, and which more especially appear at the commencement of the fever; and inflammation of the stomach is sufficiently characterized by the anxiety, restlessness, vomiting, and prostration of strength which immediately follow.

As a common consequence of extensive peritoneal inflammation, we sometimes find a quantity of serum effused into the cavity of the abdomen, and various adhesions formed between its parietes and the contained viscera; and the omentum at other times so much wasted, as to resemble merely a tissue of red vessels. The liver almost always exceeds its natural size, and is also considerably altered in colour and texture. It is always softer than natural; and the system of the vena portæ is always turgid with blood. The peritoneal covering of the liver is often thickened and opaque, and is sometimes studded with white spots, or with flakes of coagulable lymph. Sometimes its surface is irregular, and small indurated portions are discovered on its convexity, which when cut open,

* The reader will not fail to perceive the coincidence of Mr. Boyle's ideas with my own, though the writers were separated by many thousand miles at the time.

are found to proceed from obstruction of some ramification of its excretory ducts, produced by inflammation of its coats, and favouring the accumulation of viscid bile.—The coats of the cyst generally partake of the inflammation. The colour of the bile it contains is various, and it is sometimes so viscid and thick, that it can scarcely be forced out by strong pressure.

A remarkable alteration also takes place in the appearance of the spleen. It does not always, however, exceed the natural size, but its softness is often such, that it can only be compared to a mass of coagulated blood; while, at other times, it has an unusual degree of hardness, with thickening and whiteness of its peritoneal coat.

The stomach is frequently found contracted and empty, or inflated with air, or distended with variously-coloured fluids, and even pure bile. Sometimes inflamed spots are covered on its peritoneal coat; but the internal surface is the most frequent seat of disease. The texture of the villous coat is often completely destroyed, and it exhibits an uniform red, of the deepest hue, in several places approaching to a livid colour, and is covered with coagulable lymph, or a secretion of puriform matter tinged with blood. In other cases, the inflammation is more limited, and appears in rosy patches over its internal surface or in numerous minute red specks.

This inflammation is never of the phlegmonous kind, but like true erythema, successively invades one part after another, frequently creeping along the whole course of the alimentary canal, attended with thickening and pulpiness of its coats.

The brain and its membranes show no uncommon appearances, or marks of previous inflammation.

The lungs are not affected, but I have often found a large quantity of serum, of a yellowish colour, collected in the pericardium, while the heart seemed to have suffered from inflammation; and in two or three

cases, I observed white patches of coagulable lymph, apparently converted into firm glistening membrane, easily separated from its proper coats, on different parts of its external surface.

Such, indeed, is the rapid progress of the disease, and the great delicacy of the organ principally concerned, that our measures must necessarily be prompt and vigorous; and under whatever varieties it may appear, with respect to type, the local symptoms always require our first attention, and indicate the necessity of copious evacuation of blood. If the fever be of the continued form, under such treatment it very often becomes intermittent, and when of this latter form, we thereby prevent its being changed into a more dangerous type, in the course of its progress.

From the use of this remedy, we are not always to be deterred by the smallness of the pulse; and even if deliquium should come on after the abstraction of a few ounces of blood, the operation may be repeated soon afterwards, without the occurrence of the like accident.

The indiscriminate use of the term *debility*, derived from some of the more general phenomena of disease, without regard to its essence or cause, has led into egregious error in the treatment of this, as well as of some other complaints, which are commonly considered as simple idiopathic fevers. The anxiety, languor, restlessness, and prostration of strength which accompany this epidemic, are not symptoms of debility, but of gastritis, and depend on the peculiar structure of the organ, and its extensive sympathy with the whole system. A free use of the lancet is required; and, in order that this remedy may be productive of beneficial effects, it must be had recourse to at an early period of the disease. Even when the disease was too far advanced for any permanent advantage to be expected from venesection, its effects have been discovered by a temporary in-

crease of fulness of the pulse. What is here said, applies equally to general and local blood-letting; and this last mode may be employed with considerable advantage.

In the inflammation of all delicate and highly sensible membranes, unless we succeed in the first instance, we in vain attempt to subdue it afterwards, by acting on the arterial system at large, and still further diminishing the *vis á tergo*: for the disease makes rapid progress; the texture of the organ is speedily destroyed, and its vitality is irrecoverably lost.

Recourse must, therefore, at the same time, be had to such means as possess some control over the vessels of the part suitable to its peculiar functions and organization; and the effects of local blood-letting, by the application of a number of leeches to the region of the stomach, are to be further assisted by large and repeated blisters.

Nothing so much aggravates all the symptoms, as the presence of acrid bile, and accumulated feculent matter. All irritation, therefore, from such causes, is to be carefully prevented; and, with this view, the contents of the intestines are to be dislodged on the first approach of the disease, and their accumulation cautiously guarded against during its continuance. For this purpose, small doses of purgative medicines must be frequently administered. It too often happens, however, that the irritability of the stomach is such, that medicines of this class cannot be retained, but are instantly rejected; and recourse, therefore, must also be had to large emollient and laxative glysters, which must be frequently injected, and are in all stages of the fever, of the most essential service. As a purgative, no medicine is so well adapted to this complaint as the sub-muriate of mercury; and its operation may be sometimes advantageously alternated

with the use of sulphate of magnesia dissolved in water, and plentifully diluted.

The effects of mercury, however, are not to be estimated solely by its purgative quality; but it seems to be chiefly useful, on account of its specific action on the hepatic system, and its power of affecting, through the medium of the circulation, secreting surfaces endowed with high irritability, and in a state of inflammation. This remedy is, therefore, to be used externally, as well as internally; and is to be resorted to immediately, as the most powerful remedy we possess in the treatment of this disease. Its effects, however, do not always depend on the quantity introduced; but on certain conditions of the system, by which the latter is rendered more or less susceptible of its action, and which I do not pretend to explain.

This susceptibility is indicated by the effects produced on the salivary glands; some degree of ptyalism follows, which affords the surest prognostic of a favourable termination; and the change produced in all the symptoms is generally quick and rapid. It sometimes, however, happens, that the largest doses will not produce salivation, and in such cases, the event is invariably fatal.

From the rapid manner in which we are frequently induced, on account of the severity of the disease, to introduce this medicine into the system, copious salivation is frequently occasioned, and often appears suddenly, with bleeding from the gums; but as no advantage is to be expected from the mere secretion from the salivary glands, I have succeeded equally well, after having ascertained its influence over the disease, by continuing its use in small doses, merely sufficient to keep up the mercurial irritation in the system, until the disease was completely overcome. From what has been said, it needs scarcely to be observed, that the practice of besmearing the gums with mercurial

ointment, or rubbing them with calomel, for the purpose of encouraging this secretion, is extremely ineffectual.

Sometimes severe diarrhœa comes on during the early stages of recovery, attended with want of sleep; in which case I have derived the greatest advantage from small doses of opium, combined with calomel.

We are usually advised, in *all* fevers which show a tendency to intermit, to watch this period carefully; and to avail ourselves of the earliest opportunity such circumstances afford, of exhibiting bark in large doses, with a view to obviate the *debility* which, it is said, predisposes to the formation and return of another paroxysm. That in *some* fevers, and in certain habits and constitutions, this may be highly expedient and advisable, I do not venture to deny, as such practice stands supported by the best authority, and is justified by ample experience.

Without entering, however, into an examination of the above principles, which generally direct its use, I feel myself warranted to affirm, from the result of several cases in which this plan was adopted, in *the fever now under consideration*, that bark served only to exasperate the local disease, and to aggravate every symptom of the succeeding paroxysm.

In many cases which occurred towards the final cessation of the epidemic, at the close of the autumnal season, the local symptoms were much milder, and the fever became intermittent, after a moderate evacuation of blood, and a free use of laxative medicines. In those cases, calomel was the medicine I chiefly employed; and I almost invariably observed that, when carried to an extent sufficient to manifest its action on the system by the usual criterion, the paroxysm soon after ceased to return.”—*Ed. Journal*.

The testimony of such a man as Boyle in favour of the *union* of depletory measures with a mercurial treatment, will have some weight; and in conjunction

with the various documents brought forward in this essay, must remove all doubts on the occasional necessity of such a modification of practice.

EGYPT.

SEC. V.—Independent of those sensations of pride which every Briton must feel at the mention of Cairo, Alexandria, or the Nile, the memorable theatres of British valour, Egypt presents an interesting link in the medical topography of tropical and tropicoid climates. Stretching, in the shape of one of its own pyramids, from Cancer to the Mediterranean, and flanked on both sides by burning sandy deserts, the thermometrical and barometrical qualities of its atmosphere bear little similarity to those of parallel latitudes; and hence the influence of this anomaly in climate on the health of the human race, is a matter of useful inquiry.

The thermometer at noon, in the shade at Cairo, averages 97° in the months of May, June, July, August, September, and October, with a diurnal vicissitude of 30 or 40 degrees. In the winter months, it averages 70° and is never seen below 40. During the hot season, from March till November, the air is inflamed, the sky sparkling, and the heat oppressive to all who are unaccustomed to it. The body sweats profusely, and the slightest suppression of perspiration is a serious malady. The departure of the sun tempers, in some degree, these heats. The vapours from the earth soaked by the Nile, and those brought from the sea by northerly and westerly winds absorb the caloric dispersed through the atmosphere, and produce an agreeable freshness, which causes the susceptible Egyptian to shiver with cold; excepting in the winter, and near the sea, a shower of rain is rarely

seen. The winds vary in their temperature and dryness or humidity, according to the point from whence they blow, and the season of the year. From the north and west they are moist and cool, as passing over the ocean ; from all the other points they are hot and dry, as coming over vast tracks of burning sand. The south wind, in particular, is called the *Kamsin*, *Simoom*, *Samiel*, &c. the heat of which is similar to that of a large oven at the moment of drawing out the bread. The atmosphere now assumes an alarming aspect--the sky becomes dark and lurid--the sun loses his splendour, and appears of a violet colour. This wind increasing gradually as it continues, affects all animated nature. Respiration becomes difficult--the skin parched and dry ; and the body is consumed as though by an inward fire, for no quantity of drink can restore the perspiration. In December and January, however, these southerly winds are *cool*, as they then come over the snow-capt mountains of Abyssinia, the sun being at his furthest southern declination.

Now, as, in summer, the most prevalent winds come from the Mediterranean sea, impregnated with aqueous particles, so copious dews are precipitated in the nights of this period, all through the delta in particular, occasioned by, and increasing the diurnal transition. Thus at Alexandria, after sun-set, in the month of April, the clothes exposed to the air, and the terraces are soaked by the dews, as though there had been a fall of rain. To this it may be added that a portion of the valley of Egypt is annually overflowed, for two or three months in the summer, by the waters of the Nile, either by natural inundation, artificial canals, or machinery.

If this slight medico-topographical sketch, be compared with what I have said respecting Bengal and the Coast of Coromandel, it will, at once, be perceived that the climate of Egypt combines, in a conside-

rable degree, the peculiarities of both the former. It has the *inundation* from its central river, as Bengal; —it has its *samiels* or hot land-winds, with an excessively high range of temperature, as Madras. Now if these two peculiarities equally prevail in Egypt, we may expect to find an equal ratio of the diseases peculiar to the two Asiatic localities above-mentioned; whereas if we find one of the climates predominate over the other, and also one of the classes of disease obtain a proportional superiority, it will surely go far to elucidate and confirm the origin and nature of those endemics peculiar to the two oriental provinces, described in the early part of this work.

First, the inundations of Bengal and Egypt are very different. Accompanying the *former*, there are constant deluges of rain that keep all parts of the ground in a splash. In the *latter*, what is not inundated is dry. In Bengal, the bed of the inundation, when the waters have subsided, remains long in a miry state. In Egypt, such is the power of the sun, the aridity of the atmosphere, and the force of perflation, that the water has no sooner deserted the plains than the *latter* are turned into a solid crust, which soon splits into innumerable segments. “At that time, the soil, in hardness, resembles one continued rock, and is fissured every where with deep chinks. When we encamped in the delta, it was impossible to drive a tent pin into it, except by fixing it in one of the openings; and the detached clods, lying around, were hard enough to be used as mallets.” *Dewar on Dysentery in Egypt*, p. 3—4.

From these circumstances, we are prepared to find that the extrication of *miasmata* in Egypt is on a very confined scale indeed, when compared with Bengal, and consequently that remittent and intermittent fevers are in proportion. “Egypt, says Dr. Dewar, is “less exposed than most other flat countries, in high “latitudes, to bilious fevers of the intermittent and

“remittent kind, as it is free from those marshy miasmata which serve to generate and to cherish the contagion of these diseases. Intermittent fevers only prevail during the decrease of the Nile, *in houses surrounded with stagnant water*. At other seasons they are confined to places in the neighbourhood of extensive rice grounds, such as the town of Damietta,” p. 5.

It is true, indeed, that in particular situations, those natural causes which have happily secured Egypt from the deleterious influence of paludal effluvia, are counteracted by the perverseness and filthiness of the inhabitants. “This advantage, however, is counterbalanced by the dirty mode of living that generally prevails. The people seldom wash their clothes, and never shift them on going to bed. The offals of butchers’ stalls are left in the open street, where they perpetually spread putrefaction and poison in the atmosphere. The sun would in some degree, obviate this mischief, by drying them into hardness; but after they accumulate in the streets, they are thrown into the river or the sea, where they not only pollute the water, but *lying just within water mark*, [there are no tides,] are soaked with that quantity of moisture which is sufficient to keep the putrefactive fermentation in its most active state, and which allows them to disseminate their effluvia in the air.”

On Dysentery in Egypt, p. 6.

Now, having satisfactorily accounted for the comparative immunity from miasmal fevers, which the Egyptians enjoy, beyond the Bengalese, let us turn to the parallel between Egypt and the Coromandel coast. But here the disparity of climate is not so great as in the other two instances, and the great prevailing diseases are proportionally analogous. I have traced the gradual deterioration of the biliary apparatus on the Coromandel coast to a high range of temperature, and its sudden derangements to atmos-

spherical transitions. The very same thing happens in Egypt—from similarity of cause. “Elephantiasis and leprosy, says Dr. Dewar, are frequent diseases in Egypt. *Obstructions in the liver and dropsies are still more frequent,*” p. 6. How much our troops suffered from *dysentery*, which I have proved to be connected with *liver* disease, is well known to our army surgeons; and Baron Larrey was so struck with the prevalence of *hepatitis* in Egypt, that he has taken some pains to frame a theory for its explanation. He attributes the cause to a high range of temperature dissolving the fat of the mesentery, which becomes clogged in the liver. I do not quote his theory for its ingenuity, but to show the extent of the disease. And now I trust the idea of Dr. Saunders and many others, that hepatitis in India is owing to a *local indigenous poison* there, unlike any thing in any other country, will no longer be held.—This section has proved an identity of cause and a similarity of effect in India and Egypt, and consequently has solved a mystery that obstructed the path of medical science on an important point in pathological investigation.*

Before leaving the banks of the Nile, let us glance at a few *indigenous* customs, from which the medical philosopher may often glean useful hints. The natives, during the hot season, subsists chiefly on vegetables, pulse and milk. They make frequent use of the bath, and avoid stimulating beverages. Those

* I have already hinted that on the Coast of Africa where the heat is excessive, liver complaints are very prevalent. Of this I lately saw a striking example in the Tigress brig after returning from that station. No ship from India ever presented a more distressing picture of hepatitis and dysentery than this vessel did. Captain Beaver in his African memoranda gives the following thermometrical ranges of the six winter months, viz. from August to April. August 74 to 82—Sept. 77 to 85—Oct. 81 to 91—Nov. 84 to 96—Dec. 64 to 92—Jan. 63 to 98—Feb. 88 to 96—March 86 to 95—April 85 to 94°. Captain Beaver’s work shows the prevalence of hepatic diseases on the coast.

who live in tents take care to have their coverings constructed double, in order that the non-conducting stratum of air may defend them from the atmospheric heat. Again, as in the East, the various folds of the turban form a powerful non-conductor, when they are exposed to the direct rays of the sun, and preserve them from *Coups de Soleil*, while the sash, like the oriental *cummerband*, encircling the abdomen, preserves the important viscera within from the deleterious impressions of cold, during a sudden vicissitude of temperature, or an exposure to the dews or night air; thus forming an article of utility as well as ornament.

LOIMOLOGIA;

OR,

Practical researches on the Plague.

SEC. VI.—Many philosophers have attempted, and with no mean success, to trace a chain of animated beings from man down to the polypus; and thence through the vegetable creation to the mineral in the bowels of the earth; so that—

—————“Whatever link we strike,
“Tenth, or ten thousandth, breaks the chain alike.”

It would not, perhaps, be very difficult to show a similar catenation in the circle of diseases by which we are surrounded. There are scarcely two diseases, however opposite in their phenomena when viewed in an insulated shape, that are not linked together by others partaking in the nature of both. At a first glance the yellow fever and small pox would seem unmeasurably separated and widely distinct in every respect; yet the *plague* presents as fair a connecting link between them as the polypus does between the animal and vegetable kingdoms. Like Causus, the

Plague is under the influence of the *atmosphere*, and limited within certain *thermometrical* ranges:—like small pox, it is propagated by contact, inoculation, or exhalation; and productive, in general, of local eruptions. Nevertheless it is as distinguishable from either, as the polypus is from the Lord of the Creation on one side, or the Cedar of Lebanon on the other.

This destructive and mis-shapen enemy of the human race has ever been clothed in darkness and mystery, which add not a little to its real and imaginary terrors.—It may justly be characterized as a—

“*Monstrum horrendum informe, ingens cui lumen ademptum!*”

Which unites all the bad qualities of the two diseases alluded to. It combines the rapid march and fatal issue of the western *causus*, with the dire contagious influence of the Eastern *Variola*!*

Such an engine of destruction must, long ere this, have annihilated mankind, had not the omniscient Creator encircled it with various atmospherical barriers which are constantly arresting its progress, or suspending its powers. If “the pen of writers has done little more than record the times and places when and where it proved most fatal—its devastations, and the variety of modes of treatment which had no certain success,” be it remembered that this very sentence, so disheartening to the medical philosopher, was, not long since, applied to *dysentery*, over which we have now a very strong control. All then may not be lost in respect to the plague. It may yet come under rule, and bow beneath the influence of medicine. At all events, it is our duty, as it ought to be our pride, never to succumb without a struggle. Let the Ottoman lie supine under the fetters of fatalism, while

* One of the latest writers on the subject of plague, Dr. Calvert, asserts that its poison radiated through the *atmosphere* on the inhabitants of Valletta, from a vessel in the centre of the quarantine harbour, and consequently that all precautions against contact were useless and delusive.—*Med. Chir. Trans.* vol. vi.

the Christian philosopher exerts those faculties bestowed on him by his Creator, in defending that Creator's noblest work from *premature* decay !

Although the venerable and laborious Russel shall form the text or basis of this section ; other and more recent writings will not be overlooked. But as *references* and formal *quotations* would swell the work too much ; and as I have no particular theory or practice to support on the occasion, the reader will probably give me credit for fidelity and accuracy in the compilation, and absolve me from all suspicion of misrepresentation.

Previously, however, to entering on the symptomatology, &c. of the disease, it is necessary to state that I have derived much assistance from my esteemed and able friend Dr. Dickson of Clifton, in this section of my work. Dr. Dickson while stationed in the Levant, in the year 1803, had frequent opportunities of collecting interesting information relative to plague, and particularly from Padre Luigi de Trincon who, for a great number of years, had been superintendant of the plague hospital at Smyrna. The history of this venerable and benevolent man, as related by himself, and authenticated by others, is briefly this. Having been most severely attacked by the plague, about thirty-six years previously, and his life being despaired of, he made a vow, in the event of recovery to dedicate his services to those who should be similarly afflicted. He recovered, and for some time adhered to his resolution ; but the desire of revisiting Pavia, his native country, induced him to leave Smyrna. His vow, however, continually recurred to him ; and he soon returned again to Smyrna, where he has ever since pursued his original resolution of attending on those afflicted with plague. He administers to his patients with his own hands ;—consoles and cheers them ;—sits, and even sleeps upon their beds ; and in fine has been principally indebted

for his success to such attentions, as he knows little of medicine.

Sub-sect I. Symptomatology. Fever.—This, according to Russel, was, with very few exceptions, a constant attendant at one stage or other, but varying greatly in different subjects. Usually preceded by sense of weariness, shivering, and confusion rather than pain in the head. Cold stage shorter than in tertian; but the symptoms in hot stage more anomalous and alarming. In many cases, however, the pyrexia differed so little from that in other fevers, as to lead to no diagnosis, unless buboes were protruded, which left no doubt. Fever usually declined in the morning of the second day; but varied much in intensity of force, even in the 24 hours; the exacerbations being irregular as to violence and duration. Generally speaking, there were morning remissions and evening exasperations. Still the march of the disease was rapid—the patient, on the second or third day, being reduced, in point of muscular strength and sensorial energy, to the condition of one in the last stage of typhus. Yet to this desperate state would succeed a remission in which his senses and intellectual faculties were restored—the vital functions went on calmly, and all but weakness seemed to have vanished like a dream.

Remissions of this kind, when early in the disease, or unpreceded by a sweat, were often fallacious; but when on the third day, or later, and induced by a sweat, especially if the pulse kept up, and the head clear, they gave hopes of a favourable issue.*

Delirium.—Not so high as in some other fevers†—

* The *initiatary* symptoms, according to Faulkner, the latest writer, were at Malta, besides the foregoing, pain of the back opposite to the kidneys—drunken appearance of the countenance—inability to stand upright—aversion to being thought ill. “I have neither drunk wine nor spirits,” said General Menou, “and yet I feel as a drunken man.”

† Sir B. Faulkner found it rise to *maniacal fury* in some instances, at Malta.

seldom commenced before the second day, increasing in the exacerbation, lessening in the remission—sometimes going off for some hours in the day, but returning at night. Padre Luigi corroborates this statement, but has seen delirium and insensibility come on early.

Coma.—Very often alternated with the delirium.—It was always a dangerous symptom; but more so as it approached early, and failed to abate in the remissions. The patient is roused without difficulty—answers rationally at first, but soon becomes impatient—denies having slept, and as soon as left, relapses again into slumber.*

Loss of speech, faltering, and tremor of the tongue, were not uncommon symptoms. Impediment of speech sometimes continued for months after recovery. Dr. Dickson, who had frequent opportunities of seeing plague in the Levant, observes that the tremor of the lips is often of a peculiar kind, a sort of biting motion, which is a dangerous symptom.

Deafness was seldom observed; though the sense of hearing was occasionally impaired. Dr. Dickson informs me that the patients sometimes became deaf.

Muddy Eyes.—This was a remarkable symptom. It sometimes was visible from the first day, but more commonly from the second or third, remaining till some favourable change took place. It is a strange compound of muddiness and lustre—is little affected by the remissions; but, in the exacerbations, the eyes acquire a redness that adds wildness to the look. The disappearance of this symptom is always favourable. It was almost invariably present in fatal cases. Sir B. Faulkner considers it without doubt one of the most leading and faithful monitors of the presence of plague. He was seldom wrong in his diagnosis,

* The comatose symptoms strongly resemble those of the Marié-galante fever, so well described by Dr. Dickson in a subsequent section.

where any unusual whiteness of the tongue accompanied this appearance of the eye—"even though there was no intumescence or redness about the glands, nor any confession of complaint." In the first instance which Dr. Dickson saw of the plague, and where he was unintentionally a visitor, he was particularly struck with the drunken appearance of the eye, and was at a loss what to think of the case, until the patient showed him a bubo in his groin!

White Tongue.—The tongue was often natural; but when it changed, it generally became white, and remained moist. Sometimes it was parched, with a yellowish streak on the sides, and a reddish in the middle; but its condition rarely corresponded with the febrile symptoms.

Pulse, is generally low, quick, and equal; in some bad cases, fluttering or intermittent, or low and nearly natural.—In the more advanced stages of the disease, instead of rising in the exacerbations, the pulse was apt to quicken and become so small as scarcely to be felt. At Malta, in the last plague, the pulsations in ulterior periods, seemed to succeed each other in a continued stream, and defied calculation. But this function varied so much as to be *res fullacissima*.

Respiration was seldom affected, except in the exacerbations of advanced stages, when it became laborious. No pain felt on a full inspiration. Yet the patients frequently sigh, as if from oppression on the lungs.

Anxiety, that is, a sense of oppression about the præcordia, is a constant attendant on the plague; and its early appearance was unfavourable. "The sick," says Russel, "showed how severely they suffered, by their perpetually changing posture, in hopes of relief; but when asked where their pain lay, they either answered hastily, 'they could not tell,' or with a fixed, wild look, exclaimed—'Kulbi! Kulbi!' (my heart! my heart!) This anxiety encreasing as the disease

advanced, terminated at length in mortal inquietude," p. 88.

Pain at the Heart.—Though this was often conjoined with, it was often distinct from the anxiety above-mentioned. The patients often exclaimed, as in the other case, my heart! my heart! pointing to the *Scrobic. Cordis*; but then they would add *eujani Kulbi*, my heart pains me! or *naur fi Kulbi*; my heart is on fire! They could not bear the slightest pressure at the precordia.

Debility.—The sudden prostration of muscular strength and nervous energy appertains in a particular manner to the plague, beyond that observed in any other disease. By its higher degree the more fatal forms of plague were distinguished. "In the most destructive forms of the plague, the vital principle seems to be suddenly, as it were extinguished, or else enfeebled to a degree capable only for a short time to resist the violence of the disease. In the subordinate forms, the vital and animal functions, variously affected, are carried on in a defective, disorderly manner, and denote more or less danger accordingly." —*Russel*, p. 89.

Fainting, in different degrees, was a very common symptom, and sometimes, though rarely, terminated in syncope. It was not so much aggravated by the perpendicular, nor relieved by the horizontal posture, as in other fevers.

Convulsions sometimes mark the access of the fever; and convulsive motions of the limbs frequently attend the course of the disease, especially where there is a numerous eruption of carbuncles. *Subsultus tendinum* is not a very common symptom; but a continual trembling of the hands is generally observed. Luigi informed Dr. Dickson that singultus was not an uncommon symptom, and that sneezing was a very favourable phenomenon.

Urine.—Nothing decisive can be learnt from this

excretion. Luigi, however, frequently observed it of a very high colour, and depositing a lateritious sediment.—*Dickson*.

Perspiration.—Where the skin remains torpid and dry continually; or where short and precipitate sweats are attended with no favourable symptoms, danger is to be apprehended. On the other hand, the spontaneous supervention of an early perspiration is a flattering omen.

Vomiting.—This symptom, according to Russel, is “absent in a large proportion of the sick.” Where it began early, and continued obstinate, it was a fatal symptom.—Bile was sometimes thrown up, accompanied with bitter taste in the mouth—“a yellowness in the eyes,” and “a blackish liquor sometimes came off the stomach in the last stage of the disease, in the production of which, blood may, perhaps, have had some share.”—*Russel*. Faulkner makes no mention of *vomiting* in the late plague at Malta; but says, that in the worst species the “stomach was extremely irritable.” Russel admits that *nausea* was more common. Is not “stomach extremely irritable” equivalent to the mention of vomiting?

Diarrhœa,—sometimes comes on the first day, but more usually supervenes in the advanced stages of the diseases, and in either case, unless other things were favourable, may be set down as a *signum funestissimum*. Russel, and Faulkner. The latter observes that, in the plague at Malta, the alvine evacuations were commonly of a darker appearance than natural—sometimes of a greenish tinge mixed with scybala, particularly where voracity of appetite attended. Dr. Russel sometimes saw dark-coloured blood discharged by stool, unmixed with feces, and without griping. “Costiveness was attended with no harm and often with little inconvenience.” Russel. Luigi confirms this remark.

Hæmorrhages were, in general, unfavourable symptoms.

Thirst, the never-failing attendant on febrile diseases, is by no means invariably present, even in the worst forms of the plague. “The like remark holds of want of appetite. Throughout the disease, this function is not only *not* impaired but augmented to a degree bordering on voracity.” *Faulkner*.

We shall not follow Dr. Russel through his six classes of the disease, but rather adopt the concise and less complicated divisions of Sir Brooke Faulkner, in his recent description of the plague at Malta.

Species I.—That in which, at the first attack, the energy of the brain and nervous system is greatly impaired, indicated by coma, slow drawling or interrupted utterance. In this description of the disease, the tongue is white, but little loaded with sordes, and usually clean, more or less, towards the centre and extremity; the anxiety is great; cast of countenance pale; stomach extremely irritable, and the strength much impaired. Rigors and pain in the lower part of the back are among the early precursors of the other symptoms. This was observed to be the most fatal species of plague, and prevailed chiefly at the commencement of the late disasters. Those who were thus affected died sometimes in the course of a few hours, and with petechiæ.

Species II.—The next species I would describe is, that in which the state of the brain is the very reverse of what takes place in the former, the symptoms generally denoting a high degree of excitement: the pain of the head is intense; thirst frequently considerable, though sometimes wanting; countenance flushed; and utterance hurried. The attack is ushered in by the same rigors and pain of back as the foregoing. Epistaxis not unfrequently occurs in this class of the disorder. The glandular swellings come out very tardily, and after appearing, recede again,

without any remission of the general symptoms Carbuncles arise over different parts of the body or extremities, which are rapidly disposed to gangrenous inflammation. The delirium continues extremely high and uninterrupted, and the patient perishes in the course of two or three days. Sometimes he lingers so far as the seventh, yet rarely beyond this period, without some signs of amendment. Of this second description, the examples have been very numerous, and were nearly as fatal as the preceding. In the countenances of some, just previous to the accession of the more violent symptoms, there is an appearance of despair and horror which baffles all description, and can never be well mistaken by those who have seen it once.

Species III.—The third species which I would enumerate, is nearly a kin to the last, only the symptoms are much milder, and the brain comparatively little affected. The buboes and other tumours go on more readily and kindly to suppuration, and by a prompt and early employment of remedies, to assist the salutary operations of nature, the patient has a tolerable chance of surviving. Cases of this kind are often so mild, that persons have been known to walk about in seeming good health, and without any evident inconvenience from the buboes. Of this last species, the instances have, thank God, not been unfrequent, chiefly occurring towards the declension of the maulady."

Buboes and Carbuncles.—The presence of these, separately or in conjunction, is diagnostic of true plague; and removes all doubt as to its nature; "but fatal has been the error of rashly, *from their absence*, pronouncing a distemper not to be the plague, which, in the sequel, has desolated regions, and which early precaution might probably have prevented from spreading."—*Russel*.

Although in some of the worst forms of the disease,

[for instance in Russel's and Faulkner's *first* classes, where the patients frequently perished in twenty-four or thirty-six hours,]—buboes and carbuncles are rare, yet, generally speaking, they may be considered as constantly concomitant phenomena:—not so carbuncles, which were observed in about one-third of the infected only. The inguinal, axillary, parotid, maxillary and cervical glands were the seats of buboes in the order they are set down; but the *first* was by far the most frequent. The inguinal pestilential bubo was, for the most part, situated lower in the thigh than that of the venereal. A burning, shooting pain, is often felt in the part, anterior to the appearance of swelling; and, when the tumour is once formed, there is always pain on pressure. In the incipient state of the bubo, a small, hard, round tumour is felt by the finger, more or less deeply seated, but generally moveable under the skin, which is yet colourless and non-protuberant. As the gland enlarges, it commonly takes an oblong form—becomes more moveable,—and the integuments thickening, protrude into a visible, circumscribed tumour, without external inflammation. The progress to maturity is more or less rapid; but not apparently influenced by strength of constitution or the contrary—hence the prognosis from the bubo is very uncertain.

In Dr. Russel's experience, the bubo seldom began to inflame *externally*, or show symptoms of maturation till the fever had abated, and was manifestly on the decline. This happened at various periods, but rarely sooner than the 8th or 9th day, the inflammation then advancing, the tumour, by degrees softened, and opened of itself between the 15th and 22nd day. The buboes that did not suppurate, dispersed gradually in one or two months.

In a very large proportion of Dr. Russel's patients the buboes made their appearance in the course of

the first day. In the slightest cases, they were often the first symptom of infection.

Carbuncles were seldom observed by Dr. Russel before the month of May—they grew rife in the summer, and became gradually less common in autumn. The carbuncles that fell under the observation of Sir Brooke Faulkner in the late plague in Malta were of that kind described by authors as the *wet carbuncle*, sloughing into very deep sores, and attended during the progress of inflammation, with an extremely painful burning sensation. At first, they arose like a phlegmon, gradually acquiring a diffused and highly inflamed base, and having, not far from the apex, a concentric areola of a deep livid, and more internally of a cineritious colour, and a glossy appearance. These carbuncles were not confined to any particular part of the body or limbs, though most commonly they are situated upon some part of the extremities. Of the *dry carbuncles*, as they occurred in a few cases, the description corresponds with that of authors—being of a dark, gangrenous colour, without much pain, with little or no inflammation, or elevation above the surface. *These* were always unfavourable symptoms.

Petechiæ in the plague at Malta were various in point of size and colour—in some, of a dark, or dusky brown—in others livid—in some, so small as to be almost imperceptible—in others, as large as flea bites. *Situation*, over the breast, arms, wrist—sometimes over the back, or lower extremities.

Pathology.—As scarce a ray of light beams upon this subject from *Post Mortem* researches,* and pro-

* Baron Larrey opened a few bodies dead of the plague in Egypt, and found the liver engorged and disorganized—the stomach and intestines gangrened—the heart soft and flabby. The brain was not examined. One of the assistants who helped to open the bodies caught the plague and died. The above phenomena are little different from those presented as the effects of other fatal congestive fevers.

bably never will, we are left to ground our pathological *opinions* on the phenomena of the disease, in its course to recovery or death. Upon a careful review of these, it is but too plain that *remedial measures* have had, as yet, scarcely any control over plague. In the *graver* forms, medicine has been confessedly useless—in the *milder*, it was probably unnecessary—in the intermediate shades it may have had some influence. From this, and various other considerations, we may most safely conclude that plague, though influenced by the atmosphere, is propagated by a poison or contagion, strictly *sui generis*,—equally as much so indeed, as that of variola. Now, over any one of these *eruptive* contagions, excepting the syphilitic by *mercury*, and the variolous by inoculation, we have not one particle of power, *after* it is received into the system.* In what way they produce their baneful influence on the living machine we are nearly, if not totally ignorant; but their effects are expressed by three great features or phenomena—depression and reaction, with a local determination. In the *first*, when excessive, and consequently dangerous, the powers of the system seem paralyzed or *stifled*, and are not unfrequently annihilated;—In the *second*, when excessive, and consequently dangerous, Nature appears in her frantic efforts, to commit suicide on herself, by destroying some organ essential to life, or exhausting, beyond recruit, the whole fabric;—In the *third*, or local eruption, some *sanative* process is effected, of which we *only* know that it is sanative—

—————Sive illis omne per ignem
Excoquitur vitium, atque exudat inutilis humor:—
Seu plures calor ille vias, et cæca relaxat
Spiramenta. *Georgicorum lib. 1—p. 87.*

* I mean we have no power in arresting the progress of the *process*; though we have much in mitigating the violence of reaction in the *system* itself.

Now till we find out *specifics* for the other contagious poisons, as mercury proves in syphilis, the sum total of our knowledge leads but to this ; that in the *first* instance, we are to endeavour to rouse or animate—in the *second*, to curb or restrain, and in the *third*, to leave alone, the EFFORTS OF NATURE.

This reasoning, indeed, will very nearly apply to the whole range of fevers ; but unfortunately there is something more mysterious and intractable in those accompanied by *eruptions*, than in any of the others. This is particularly the case, in those forms of plague where nature appears to lie prostrate under the influence of the poison, without the power of resistance, much less of reaction ! Here we may apply the warm bath to the external surface of the body, and cordials or stimulants to the internal ; but alas ! the nervous and vascular systems are so entirely deranged, that nature, unable to avail herself of our assistance, sinks in the struggle, without the means of extricating herself from the mortal grasp of the enemy, or the power of accelerating her own destruction !

Plague, as an eruptive fever, differs so essentially from endemic or miasmatic fevers, not only in respect to its contagious origin, but its critical determinations, and also the mode of treatment, that one would hardly expect to find an amalgamation attempted in the present day. Yet such a doctrine has been recently maintained by two medical gentlemen, Dr. Robertson, and Mr. Torric.* The latter asserted that the plague was *not* contagious, and fell, of course, a victim to his own infatuation ; the former endeavours to show that the causes of plague and remittent fever are the same, that the symptoms, and *post mortem* appearances differ only *in degree*. He acknowledges, however, that he never saw the plague, and independ-

* London Medical Repository, Dec. 1817.

ently of this, his arguments are not of that weight that require a serious refutation.

Therapeutics.—The following is an abstract of Dr. Russel's *Methodus Medendi*. One early *bleeding*; which was very seldom repeated, excepting where circumstances unequivocally demanded it. Where vomiting was a concomitant symptom, it was encouraged by draughts of warm chamomile tea, till the stomach was well cleared of bile or other colluvies. Where this was not sufficient, an emetic of ipecacuan. was exhibited, after which an opiate. *Purgatives* were rarely given.

As soon as the stomach was settled, mild sudorifics were administered in small doses, as the acetate of ammonia and citrate of potash. If a diarrhœa prevailed, as it was never observed to prove critical, it was restrained by diascordium and opiates. Dilution—cool air in the beginning; but towards the height of the exacerbations, upon the first appearance of moisture on the skin, the sick were kept moderately covered up from the chin downwards. The diet was the lightest possible. For the coma and delirium, sinapisms and pediluvia were employed. For the oppression at the præcordia, mild cordials, acidulated drinks, and cool air were serviceable. After the height, and through the decline of the disease, bark in powder or tincture was exhibited. In the decline of the disease purging was employed by the European, but seldom by the native practitioners. Relapses, though exceedingly rare, do sometimes take place.

Treatment of the Plague at Malta.—Sir Brooke Faulkner's indications are, 1st. when inflammatory symptoms are violent at the *beginning*, to moderate them cautiously. 2nd. to restrain all inordinate efforts of nature; or support her when exhausted. 3d. to counteract putrescency. 4th. to evacuate the morbid matter. These indications are proposed to be fulfilled by evacuants, tonics, antiseptics, blisters, sudorifics.

Evacuants.—Purgatives are rarely ventured on by the Maltese, except in very strong, plethoric habits, when sulphate of magnesia is given. At other times, supertartrite of potash, manna, almond oil, &c. are most esteemed. *Bleeding*, even locally, was a precarious remedy, and no decisive benefit was obtained from its use. *Blisters* to the temples, nape of the neck, head, and shoulders were applied, in high delirium, or very low coma. Sinapisms to the soles of the feet. Mild emetics of ipecacuan. at the very beginning.

The Maltese prescribe bark, colombo, gentian, and serpentaria, as soon as the state of the head allows. As a *sudorific*, the acetate of ammonia was preferred. Opium in some cases was useful; but required caution in the administration. Wine was given in the advanced stages, and often with benefit; but required great limitation. The same of cordials. The surgeon of the 3d Garrison Battalion, Mr. Stafford, has published several cases in the 12th vol. *Ed. Journal*, where mercurial frictions, externally, and calomel internally, proved very successful. The warm bath also proved useful. The cold affusion was tried in a few cases, and Sir B. Faulkner is inclined to augur favourably of it, when guided by the principles laid down by Currie.

Such is nearly the sum of the information Dr. F. has been enabled to collect upon this disheartening subject. It only verifies the words of the Poet—

Dum visum mortale malum tantoque latebat
Causa nocens cladis, pugnatum est arte medendi,
Exitium superabat opem, quæ victa jacebat.

Prophylaxis.—Since we have made so few advances in the *cure*, we must be the more vigilant in regard to *prevention*. Of all the means which have been recommended by ancients or moderns, none are equal to personal cleanliness—temperance—avoiding *contact*, or using immediate ablutions afterwards—shunning the breath, or vapour exhaling from the bodies of the

sick—ventilation—moderate exercise—attention to the great functions of digestion, perspiration, biliary secretion, &c.—Confidence. But a most important measure is the use of *oiled dresses*, the texture of which is so completely close as to prevent the passage of the most minute particles of any matter from without. By these means every attendant on the military pest hospitals in Malta escaped the contagion. As to oil frictions, they are precarious preventives, though highly recommended by some, particularly Baldwin and Luigi.

The oil dress over every part of the body, while a sponge moistened with vinegar is held to the face, seems the most certain prophylactic. Might not a mask be annexed to the oil dress, with a tube of leather fitted to the mouth, and leading out of a door or window, through which the medical attendant might breathe while visiting the infected in Pest Hospitals and Lazarettos?

Since writing the above, a mask has actually been constructed by a foreigner, composed of pieces of light fine sponge, which are to be soaked in different kinds of fluids, according to the nature of the deleterious gas or febrific miasm against which we are to guard. This, upon the whole, seems better than the mask and tube.

Since the second Edition of this work was printed, one or two Members of the House of Commons were deluded by Dr. M·Lean's writings into a persuasion that Plague was not contagious. Accordingly a committee was appointed, and the Author of this work, among others, was examined. But nearly the whole of the evidence went so completely against the wild speculations of the learned Doctor, that the Plague question has dropped to the ground!

COAST OF AFRICA.

*Some Account of the Climate and Medical Topography of the West Coast of Africa. From the Quarterly Journal of Foreign Medicine and Surgery for January, 1821.**

In the view we shall endeavour to present of the topography of the coast of Africa as influencing the human system, our observations, although confined to that part, commonly known under the appellation of the coast of Guinea, will, nevertheless, from the general aspect and nature of the soil and seasons, be applicable to a considerable portion of country extending in both a northerly and southerly direction, from that embraced in the following Memoir. That part of the African coast to which we shall limit our description, (and which was presented to our personal observation,) commences at Cape de Verde, in lat. 15° north, and $16\frac{1}{2}^{\circ}$ west longitude, and extends first in a south-east direction, and afterwards direct east to Cape Formosa, in 4° north lat. and 5° east longitude, comprehending upwards of two thousand miles of the African shore within its range.

This part of the coast becomes interesting in many points of view. Towards each of its extremities are situated all the African settlements possessed not only by this country, but also those belonging to the Dutch and Danes. Its centre is the least known to the Europeans. To the medical philosopher, the nature of its soil and climate renders it a fertile field for speculation, and its diseases a subject deserving of closer inquiry. To every one interested in the mental and

*The reader will readily perceive that there are some *doctrines* in this article a little at variance with what I have maintained in other parts of the work. They do not, however, require discussion here.—J. J.

moral elevation of our species it affords prospects the most humiliating and degrading. Tribes of negroes, different in the degree of savage existence, inhabit the coast, and extend towards the interior; and although the difference of their customs and superstitions modify, in some respects, the extent of their social and moral perceptions, still they are not many degrees removed above the *feræ naturæ*. Tribes of Anthropophagi inhabit various places on the sea coast, and in the interior; one was seen by ourselves on the western boundary of the Ivory coast, all of them most likely descendants of the Ethiopes Anthropophagi of Ptolemy, or the savage Ethiopians described by Herodotus. A race of almost amphibious Ichthyophagi exists on the Grain coast in a state of migration, plundering the inhabitants, who are not more than a degree removed above themselves in the scale of civilization; and human sacrifice is performed by all, with the most wanton indulgence and exultation, even in those districts that have enjoyed an intercourse with Europeans for nearly three hundred years.

No account of the discoveries made by the expedition sent out by Necho king of Egypt, nor in the subsequent one undertaken by Hanno, has reached our times, sufficient for us to form an opinion of the aspect of the country, during the remote periods of antiquity. The very limited and superficial description given of the west coast of Africa by the less ancient philosophers, Ptolemy and Pliny, merely shows that the north-west extremity of this part was not unknown to them. If we may be allowed to speculate on the subject, the nature of the soil and climate, and general aspect of the country, are perhaps nearly the same at the present day, as they were at that period. If, however, they have undergone any material change, it can not be supposed to have been towards a state of amelioration. The decomposition of the

superior and more exposed strata of rocks, and the continued production and decay in the vegetable kingdom, that must have been going on during the intervening ages, render it more probable that an opposite change has been the result. We are induced to conclude that an accumulation of soil has thus taken place, which every successive age would render more rich and absorbent, and consequently more exuberant in its productions. With this increase of luxuriance upon its surface, this country would necessarily become more fertile in disease.

Macies, et nova februm

Terris incubuit cohors.

HOR. Book I. Ode 3.

The Portuguese navigators were the first of the nations of modern civilization to visit this coast, and to erect settlements. They began towards the middle of the fifteenth century to extend their voyages beyond Cape de Verde, and every successive adventurer proceeded further than his predecessor, until, before the end of that century, the whole of this coast was visited.

We shall commence our description of this coast, with the part first visited, and proceed along its shores to the southern limit, which we assigned ourselves in the proemium.

The first novelty that strikes the visitor of the African coast is its extreme lowness. The earliest indication of its approach will be afforded him by the temperature of the sea diminishing considerably, even before the seaman's plummet has declared the depth of water. Its depth begins gradually to lessen, and at length the soundings are reduced to ten or twelve fathoms; the land at last appears; the tops of trees appear to emerge out of the water, towards the eastern horizon; and in a few hours the appearance of a dense and nearly level forest indicates its near approach. While advancing towards the coast, or sailing in its parallel, the nights are enlivened by the

constant flashes of lightning upon the land, or when at too great a distance to descry it, they are seen gleaming in constant succession towards that quarter of the horizon in which it lies.

The River Gambia flows into the Atlantic Ocean in lat. $13\frac{1}{2}^{\circ}$ north, and 16° west long. about half way between Cape de Verde and Cape Roxo.

The general appearance of this river, from the account given by Ptolemy, seems to have been nearly the same in his time as at present. The country adjoining is low, and in most places thickly wooded. The soil is generally sandy; in low situations it approaches to a black mould, while, in the lagoons, and near the banks of the river, the constant inundations during the rainy season, and the accumulation of mud and ooze which takes place, render it extremely rich and absorbent. The banks of the Gambia swarm with musquitos, the different species of termites, formicæ, and with all the other insects and reptiles that are generally natives of similar climates. They are particularly numerous after the termination of the rains. At that season the earth may indeed be said to teem with them, marking a soil extremely fertile in the elements requisite to the production and growth of that class of the animal creation; as well as in those principles which are productive of disease.

The settlement of St. Mary is placed near the entrance of this river, and although not so thickly wooded as most of our African settlements, yet, from the sources of disease supplied from its banks and adjoining swamps, it has been found as fatal to European constitutions. The nature of the soil and its less dense vegetation, render at some seasons the degree of heat frequently greater than in most of the other settlements on this part of the coast; and when the sun has considerably passed the equator, towards his greatest northern declination, the thermometer in the shade has frequently indicated upwards of 100° . The

rainy season commences in July, and continues about four months. During this season, but more especially about its commencement and termination, fevers of the intermittent and remittent types are very general, and frequently prove malignant. The diseases that are most prevalent are continued, remittent, and intermittent fevers, dysentery, and cholera morbus.—These are endemic at all seasons among recent visitors, if they remain sufficiently long; and also very frequently attack seasoned residents. The fever alters its type here, as in all other places on the coast, according to the period of residence in the country, and individual circumstances of the patients.

The quantity of rain which falls throughout the year may be considered from ninety to a hundred and fifteen inches. The prevailing winds during the dry season, are the usual sea and land-breezes. Tornadoes are frequent about the setting in of the rains, and at their conclusion. During their continuance the winds prevail from the W. S. W. fraught with the accumulated moisture exhaled from the equatorial Atlantic. The harmattan wind is more feeble in its effects towards this part of the country.

That part of the coast which extends from $12\frac{1}{2}^{\circ}$ to 10° north lat. is particularly shelving, and in many places is elevated into dangerous shoals and sand banks. These shoals, in consequence of greater elevation in some places, assume the appearance of small islands, and lie detached at a considerable distance from the continent.

The Rio Grande falls into the sea in $12\frac{1}{2}$ degrees—in the place where the coast is prominently marked by a shelving character. Its mouth is almost concealed in the approach from the sea, by several considerable islands. They appear from the assimilation of their surface and degree of elevation, as if separated from the continent by the course of the river; while the aspect of their shores, and the character of

the soil, render it as probable that they have been formed from the accumulating debris, washed down by the rivers during the rainy seasons from the adjoining country, as well as from the extremity of the Kong mountains, which, crossing Africa, terminate at no great distance from this part of the coast. From among this immense range of mountains, the more considerable streams, which afterwards by their increase form the majestic rivers of the Gambia, Rio Grande, Sierra Leone, and others that present themselves along this part of the coast derive their origin. Of the islands scattered before the mouth of this river, the most considerable and most adjacent to the continent is the island of Bulama—a name become notorious in medical controversy, from its having been the source from which many of those who espouse the doctrine of the contagious nature of the yellow fever suppose the epidemic to have been derived, which ravaged the West Indies during 1793 and following years. We shall endeavour to present our readers with a view of its topography.

Its situation, in the very entrance of the Rio Grande, gives the appearance of two distinct mouths to that river. In length it is about fifteen miles, and about ten in breadth.—It presents in every direction an almost level superficies thickly wooded, and the stems of the more considerable trees surrounded by a dense underwood.

Places more devoid of the bulky vegetable productions are covered by a thick and deep grass. The soil varies from a loamy earth to a heavy clay; and the shores assume either a sandy or muddy appearance, according as they are washed on one side, by the currents of the sea, and on the other, by the stream of the river. On the sides which in fact form part of the banks of the river, every retiring tide leaves it in some degree covered by the ooze and mud borne on its current, and there left to rapid decay in a moist

and hot atmosphere. No situation could be chosen more fertile in the causes of endemic fever; both from its peculiar position, and also from the nature of the soil and exuberant vegetation.

The situation, in the mouth of the river, renders it obnoxious to the effects of the land-wind, which may naturally be expected to be fraught with the noxious exhalations produced from its banks, the adjoining lagoons, and rice grounds; while towards the sea it is in a considerable degree sheltered from the salutary effects of the sea-breeze, by the numerous and even large islands that lay without it. No one acquainted with a tropical climate, but would conclude *à priori*, from such a position, and from such a soil and climate as we have described, that the most severe cases of endemic fever must be the result. We cannot be surprised that the wretched individuals who attempted to settle upon this island were so deeply afflicted; we would have been much more astonished had any escaped. That the disease did not make its appearance among them until a considerable time after they had deserted this miasmatic hot-bed, was to be expected by every one experienced in its causes. Even when most concentrated, they never, we believe, affect the system before the seventh day; and in many cases a considerable number of weeks elapse before the febrile action commences.

The time which was subsequently spent by them at Sierra Leone, where many of them died, and others sickened, afforded those who escaped at Bulama, and whose minds were under the sedative effects arising from disappointment, a fresh exposure to causes not a whit less potent in producing malignant effects. Many of our enlightened brethren, who are conversant with the great length of time the miasmatic poison will lay dormant in the system, operating changes in it, preparatory to bursting into actual disease, will join us in the belief, that those who sickened during

their passage across the Atlantic, and by that means gave rise to the fallacious appearance of contagion, derived their disease on the African shores, by the direct operation of the endemic causes of yellow fever upon their individual systems. If there were any who had no decided symptoms of disease until they reached the West Indies, and then were seized, we consider it very likely that the state of the atmosphere, so faithfully described by Dr. Clarke, as most prevalent throughout these islands at that time, might have brought into full action, so soon as they came within its influence, those seeds of disease which were sown in the system in Africa, and which otherwise might have never appeared, but by this super-addition of epidemic causes. If, however, this should be rejected as not being sufficiently probable, we can assign another cause, one by no means unlikely to have had effect after the mental and physical privations of such an attempt, followed by such a voyage. It is highly probable that states of the system might have been possessed by those individuals, which resisted the even highly concentrated causes of endemic fever to which they were presented in Africa; yet subsequently, when both the mind and body must have undergone some change, from the scenes in which both suffered, they surely could not be supposed proof against the more energetic causes, which are necessary to the generation of an epidemic form of the disease, and which was then commencing in the West Indies. It is by no means a fair conclusion, because several of the inhabitants of Grenada, who visited the vessel that conveyed the settlers from Bulama, were afterwards seized with this epidemic at the time of its making its appearance in the island, that therefore they were infected from that vessel. It is well known that the epidemic was then commencing, not only in the West Indies, but also throughout the United States of America; therefore

it becomes infinitely more likely, that the disease in those individuals was produced by causes quite unconnected with the Bulama settlers; and would have appeared under exactly the same circumstances if they had never visited the island. The epidemic state of the atmosphere so sensibly felt, so far as this fever extended, giving rise to a malignant modification of the disease, was materially different in character from the usual endemic of the African coast.

The fever, which proved so fatal to the Bulama settlers was the seasoning, or endemic produced by causes strictly confined to the place from which it was derived, acting upon the susceptibility of new comers, and assuming either the continued, or remittent type, according to the peculiar circumstances of the patient, but with no peculiar malignity in the disease; whereas, the West Indian epidemic put on a much more violent aspect, affecting not only those lately arrived in that island, but also seasoned individuals and long residents, evidently the result of causes more multiplied and intense than those by which they had been previously affected.

If the origin of both diseases be closely looked into, the former will be found derived from the products of vegetable decay, floating in a warm and moist atmosphere; the latter combined those causes, with the extrication from an exposed surface of the more subtile elements, necessary to the constitution of a rich soil, and both were joined to a peculiar condition of the air, particularly favouring their production, as well as disposing the human system to their direct operation.

To the state of the electric fluid contained in the atmosphere, this peculiar alteration may have been owing in no inconsiderable degree; and that such was actually the case, not only in this, but also in other epidemics, we could adduce the most convincing proofs, did we not consider ourselves as having

strayed sufficiently long from the subject under consideration. From our knowledge of the African endemic we must conclude, that no proof has been ever adduced of its being capable of propagation by means of contagion, and we believe it impossible.* We therefore consider the ingenious attempt of Dr. Chisholm and his followers to convey a contagious yellow fever from Africa, and propagate it at once not only throughout the West Indies, but also through America, like the fabled flight of Dædalus—one to which the solar beams are inimical.

—————Dædaleis
Nititur pennis.————

HORACE.

After leaving the entrance of this river and passing along the coast, which takes a south-east direction, a low and swampy country every where presents itself, exhibiting the same unvaried aspect of luxuriant vegetation. The whole distance, (upwards of 200 miles,) until we approach the colony of Sierra Leone, does not exhibit a single hill, or even prominence, that can serve as a land-mark to the mariner.

Within this extent many large rivers, deriving their origin from the high land forming the base of the Kong mountains, flow into the sea. The most considerable are the Rio Nunez, the Rio Pongas, and the Dembia. These rivers, during the rainy season, inundate a great part of the surrounding country.

Sierra Leone.—As we approach this river the country assumes rather a more varied aspect. The mountains of Sierra Leone, the first that have presented themselves along this extensive range of coast, overlook the river from its southern banks, while their western base is washed by the waters of the Atlantic. When viewed from the sea, the uniformly low and marshy country, seen extending in every direction,

* I consider this expression of the writer as far too strong.—J. J.

give them a more majestic appearance than their actual elevation would otherwise entitle them to. These mountains run in an easterly direction, and nearly parallel with the course of the river, for about twelve miles, without diminishing in altitude; they then terminate abruptly in low swamps, through which the Bunch river flows in a slow and muddy stream. On the side toward the sea a chain of hills extends along the coast for several miles. These mountains are covered on every side to their summits by immense forests and luxuriant vegetation.

Free Town, the British colony upon this river, is situated about six miles from its entrance, upon its south side, and is elevated from forty to seventy feet above the general rise of the river, which at this place is about ten miles across. The soil is an argillaceous earth of a red colour, covering iron clay stone, which apparently rests on syentic rock. Unless where built upon, it is covered by majestic trees, and a vast profusion of shrubs and grass. Among these, the wild cotton tree, (*bomax ceiba*,) the palm tree, (*carica papaya*,) the cocoa tree, (*cocos nucifera*,) &c. hold a conspicuous place. The swamps, so abundant at the foot of the mountains, and along the banks of the Bunch, which falls into it about seven miles from the colony, are covered by an impenetrable vegetation, chiefly consisting of mangrove bushes, (*rhizophora mangle*;) which, by the very extensive manner they propagate themselves in all wet situations, (by shoots thrown off from their upper branches,) form impervious tracts; and are so intricately wove together as to defy eradication by the most powerful means. They cover the banks of these, and indeed all the African rivers; and by furnishing a natural barrier, preserve them in the same channels. They also contribute most powerfully in rendering such situations the certain source of disease, by retaining the mud and ooze, and other matters conveyed by the river, among their en-

tangled branches. The country to the north and east of Sierra Leone is inhabited by the extensive native States of Timmances and Benna Soosoos, and on the north by the Bulams.

No situation on the African coast could have been more unfavourably chosen for European constitutions than the one now under consideration: an abundant supply of good water is the only circumstance we can adduce in its favour. On the south and south-west, the colony is overhung by the mountains already mentioned, the only range that arrests the eye of the voyager for upwards of 1,000 miles in either direction along the coast. These with undivided attraction, arrest and condense at all seasons of the year the moisture exhaled, not only from the Atlantic Ocean, but at the same time from the very absorbent soil, and the numerous marshes and rivers that surround them in every direction. Hence in opposition to a well known law in the science of climate, "that the number of days of rain diminish as we approach the equator, while the quantity of rain that annually falls increases." The actual number of days in which rain falls is greater than in most northern climates. By a register kept at this colony, the number of rainy days amounted to 204; and of the remaining dry days, although the moisture in the atmosphere was not actually condensed into rain, yet the greater proportion of them exhibited its progress towards that state; not only the adjoining mountains, but the river and its banks being covered by fogs and haze. Indeed few days occur throughout the year, which afford a clear view of the mountain tops: clouds are seen generally either covering their heads, or resting upon their sides, at different degrees of altitude.

The rainy season commences in June, and terminates with October, and is both introduced and closed by tornadoes. Their number, by an account kept, during one whole year amounted to fifty-four; no

part being more obnoxious to them than this and the grain coasts. The quantity of rain during the year may vary from one hundred to one hundred and twenty inches. We cannot suppose it often to fall short of the former. Thunder and lightning are of frequent occurrence here, as they also are along the whole coast; the former by the loud reverberation from the sides of the mountains, becomes doubly tremendous. The winds during the rains generally blow from the S. W. or W. S. W. About their commencement, and after their conclusion, the atmosphere is generally tranquil. At other seasons the sea and land-winds occur, but not in regular succession. The sea-breeze seldom appears, and when it does, it generally dies away in a few hours, leaving the air sultry and stagnant. The land-winds come on about sun-set, and only amount to very light breezes; and from blowing over the adjoining rivers and swamps, are generally a source of disease, especially to such vessels as may lie in the river within their noxious influence. The harmattan is less frequently and more feebly felt here than on the Gold coast.

The temperature of the air at Sierra Leone is generally not greater than 95° , but its tranquil state, in regard to its horizontal motion, favours the concentration and multiplication of the foreign ingredients, derived from the soil and decaying vegetation; consequently, the atmosphere in this state feels very sultry and oppressive. The mean temperature obtained from the degree of heat observed at different periods of the day throughout the year, was from 85° to $83\frac{1}{2}^{\circ}$. The hypothetical scale laid down by Professor Lesslie,* from the empirical law discovered by Professor Mayer of Gottingen, gives for the same latitude $83-2^{\circ}$. The harmony here observable in conclusions from data so different, is not a little surprising.

* Article, climate.—Supplement to Encyclo. Britan.

The diseases which the medical philosopher would be led to expect, resulting from the operation of this climate upon European constitutions, are exactly those which are constantly presenting themselves. They are, however, considerably modified in many of their phenomena by the period of residence, and circumstances peculiar to the patient. Accordingly, continued and remittent fevers, (commonly called yellow fever,) intermittents, dysentery, cholera morbus, enlargements of the spleen, and chronic inflammation of the liver,—are the diseases of most frequent occurrence, and generally prove annually fatal to about one-third of the white population. Of those who die, about eight-tenths are carried off by fever, the type of which varies according to the period of residence and the constitution of the individual; but whatever aspect it may assume, it derives its origin from the same causes. An occurrence took place here, which affords the most convincing proof of the correctness of our position:—Nine sailors direct from England, and belonging to the vessel in which we were, all of them having previously been either on this coast or in the West Indies, were put into a boat to convey our party to the colony, the vessel being becalmed at a considerable distance from the entrance of the river. Of those nine individuals, five had had yellow fever on either the African or American coast. The season of our arrival was in the end of June: the periodical rains had just commenced. The day was far advanced before we landed at Free Town, and the overcast sky that had succeeded a cloudless morning, was pouring down its rain in torrents. The men were detained under shelter till the evening, when the weather appearing more favourable, they were allowed to return to the vessel. On their way they were overtaken by a tornado, which drove them upon the north and more swampy bank of the river. There they remained in their drenched clothes, inhaling the miasmata disengaged

from this productive source until next morning, when they reached the vessel. These were the only individuals composing the ship's crew that had any intercourse with the land, and in them the effects of this exposure were soon expected to follow. About ten days after this occurrence the first man sickened, and within three weeks eight out of the nine had fever, under various forms. The vessel only remained nine days at Sierra Leone, and consequently was beyond the influence of the common causes of disease in that climate, before any one was taken ill. Of the four who had never before been in a warm climate, three had the disease in the continued and most concentrated type, the other in the remittent form. Of the five who, at a former period of their lives, had suffered from the same disease, three had it now in the remittent form, one a regular tertian, and the fifth had no disease at the end of two months.* These eight men were treated according to the type of fever, and prominent symptoms which were developed in the course of the disease. They all recovered; but they were, during the treatment, completely removed from the causes from which the disease originated.

After passing Sierra Leone, the country appears studded by hills, covered with wood to their summits. As we approach the Bay of Sherbro', they gradually diminish in elevation, and soon entirely disappear. From Sierra Leone to Sherbro', the distance is about eighty miles; within this extent four considerable rivers fall into the sea. This bay is formed by a range of low islands, whose south-east extremity touches the continent, and leaves it in an oblique direction, thus presenting a capacious opening towards the north-west. The country, so far as it can be

* We afterwards understood from the captain of the vessel—that, at a period of between three and four weeks subsequently, this man died after five days illness; but they were then lying within the influence of the usual causes of the disease.

viewed in either direction, is low and swampy; and although a fine sandy beach is seen edging the land, yet the soil is of a deep and heavy clay. Upon passing the large, but low, island of Sherbro', (one of the range just mentioned,) and for upwards of seventy miles, the country is uniformly low and swampy, and much intersected with rivers, until we arrive at Cape Mount. This nearly conical mountain is situated on the south side of a spacious river, bearing the same name. As we advance along the coast, the elevation so abruptly assumed on the south bank of this river, gradually diminishes; and within the space of a few miles the characteristic feature of lowness is again presented to our view. The country is every where thickly wooded. Proceeding from Cape Mount, along nearly a straight shore, Cape Mezurado, an elevated head-land, appears. The latter is about fifty miles distant from the former, and like it forms the southern barrier to a large river, which bears the same name usually given to the Cape. These rivers inundate most of the country during the rainy season.

The Grain Coast commences at this river, (Mezurado,) which is situated in 6. 30° north lat. and 10° west long. and terminates at Cape Palmas, in 4° north lat. and 7. 20° west. This coast runs between these limits in an even direction, without affording the least variety of appearance. Not a prominence is seen throughout. A dense forest covers an uniformly low land, through which a great number of small streams flow with a sluggish course. None of them are large enough to be dignified by the name of a river; nor can they admit of navigation, but by the small canoes of the natives. The coast is every where shelving, and the immense swell, especially during the rainy season, that rolls in from the Atlantic, renders this unsheltered shore generally impracticable to all, but the almost amphibious negroes.

Their villages are built upon the sea side, near the swampy mouths of those rivulets; affording them a greater facility of obtaining subsistence from both elements. The soil is a deep, rich, and heavy earth, no where leaving a stone or rock exposed. This immense plain, during the rainy season, is almost one entire morass; hence rice is generally cultivated, and forms the chief food of the inhabitants. While viewing the land at a distance of two or three miles, the slow and successive billows are heard breaking, with a continued roar, upon the extended and narrow beach; and the continued line of foaming surf separates like a zone that tumultuous element from the compact and variously-shaded productions of the soil, which form one immense forest as far as the view can extend. Occasionally, one or more trees are seen greatly elevated above the rest, forming the most striking land-mark, by which seamen may recognize the different parts of this coast. Places designed for the growth of any of the farinaceous grasses or roots, usually cultivated in this country, have, towards the end of the dry season, their exuberant, but now withered productions, set on fire; and with little further preparation the seeds are put into the ground. The quantity of rain during the year is nearly the same as on that part of the coast already described. This season commences with June, and continues about four months, attended with almost continued thunder and lightning. The wind during this time generally blows from the south-west. To this season succeeds about a month of continued fogs, with an almost tranquil state of the atmosphere, arising from the exhalation of the moisture from the absorbent soil. Although during these fogs the actual rise of temperature is inconsiderable, yet this is constantly the most noxious season of the year; and were it not, that the almost daily occurrence of tor

nadoes carry before them the rapidly disengaged malaria in their tumultuous sweep, this part of the coast would be uninhabitable to the nobler class of animals. As it is—they exhibit in all their species, the lowest varieties of formation.

Ivory Coast.—At Cape Palmas we enter upon the Ivory coast, which runs E. N. E. to Cape Lahou, in 5° north lat. and 4° west long., where it terminates. This part, like the Grain coast, is throughout its greater extent low and swampy; where it approaches the Gold coast, the country in many places assumes the appearance of a low table land. The quantity of rain and prevailing winds, and degrees of temperature, are nearly the same in this district of the country as in the last described. Indeed the whole extent of coast from the Bay of Sherbro' to Cape Lahou, embracing about 700 miles, possesses an uniform character in the soil and seasons, and in the luxuriance of the vegetable kingdom. An everlasting sameness in the face of the country reigns throughout; and, with a single exception, not a mountain, or hill, presents itself as far as the sight can reach towards the interior. The uniformly low surface is frequently intersected by small rivulets, but it no where presents any considerable or navigable rivers. Places devoid of the more majestic vegetable production are completely covered by mangroves and brambles, through which, paths between the native towns, and from them to their cultivated fields, are with difficulty formed; or even kept open. Those luxuriant natives of the soil extend to the very edge of the sandy beach, scarcely a rock being exposed. Where, however, the violence of the surf has succeeded in removing the deep clay soil, rocks of the primary formation are met with. Granite, micaceous schistus, and clay-slate, have been thus in various places exposed.

The Gold Coast.—After passing Cape Lahou, we enter upon the Gold Coast. It derives this appellation

from the gold obtained by washing the alluvial soil. It extends in almost the same directions with the former, running nearly east, in the lat. of 5° north, until it reaches the Rio Volta in 2° east longitude, where it terminates; thus embracing an extent of 300 miles.

This district of country assumes a more favourable aspect, than any other upon the western side of Africa. The natural wealth of the country, the more varied soil, and the situation it enjoys in respect of proximity to the interior kingdoms of this extensive quarter of the globe, render it better calculated, than any other we have visited, for European trade and colonization. To the voyager accustomed to view the dull uniformity displayed by the Grain and Ivory coasts, this exhibits more attractions. The great variety of scenery and the regular succession of low hills, that present themselves as we advance, with occasional rocky prominences, running into the sea, afford more striking prospects than before presented. This is also enlivened by the appearance at distant intervals, of the seats of small but civilized societies, forming the different European settlements, that are met with on the African coast. There are, however, many striking disadvantages under which it labours, and indeed in common, with the greater part previously described.

The want of navigable rivers, and the unprotected nature of the shore, from the deficiency of creeks and harbours, are alone great detriments to mercantile intercourse. In many situations in this particular district, the scarcity of good water during the dry season, is a matter of serious inconvenience, and even a source of disease.

The native inhabitants are more numerous, and their circumstances considerably superior to the other Negro tribes, who had hitherto fallen under our observation.

Apollonia is the first European settlement we meet with upon this coast. It belongs to the British African Company, and is situated in an extensive plain, in $2\frac{1}{2}^{\circ}$ west lat. In most places it is thickly wooded, but in others subjected to the cultivation of rice. It is intersected by small rivers, that inundate the greater part of the country during the rainy season. The soil is a deep loamy clay. The plain terminates in low hills as we advance towards the interior of the country. Between these and the settlement is situated a fine lake of about seven or eight miles circumference, its banks are marshy, and even during the dry season cannot fail of loading the land-winds with miasms; with which, indeed, the surrounding country, from its low and wet soil, and exuberant vegetation, must abound, through the greater part of the year. As we proceed up the country, large open prairies, or meadows of long rank grass, are frequently met with, in which elephants are found browsing even within a very few miles of the sea shore. This place is fruitful in the usual endemic diseases of tropical climates.

After leaving *Apollonia*, the coast is more hilly and varied in its appearance, and generally densely wooded, excepting the small patches of cultivated ground required to raise sustenance for the inhabitants. *Axim*, a small fort belonging to the Dutch, standing upon one of the promontories, forming Cape Three Points, next presents itself. The soil here is a deep and fine red earth, in the lower strata; towards the surface it is more loose and sandy. The surrounding country is every where covered by a thick vegetation. After quitting this place we arrive at *Hollandia*, once a considerable fort belonging to the Dutch, but now deserted. It is situated upon the sea side, as are all the European settlements on this coast. The appearance of the country is nearly the same with the part already mentioned.

Dixcove, a British fort, is built upon an elevated

prominence, forming the boundary of a large creek, in $1. 30^{\circ}$ west long. The country adjoining is hilly, and nearly impenetrably covered by large trees and bushes. The soil is generally a deep tenaceous fine clay, leaving no where a rock in sight, unless upon the sea side. The limited view afforded, led us to suppose them entirely of the primitive formation; quartzite and syenitic blocks being thrown upon the beach by the immense surf. The mouth of this creek is greatly obstructed by coral reefs.

This small fort is picturesquely situated, overlooking the small bay and Negro Town on the one side, and on the other the extended ocean, while the adjoining country exhibits a mass of verdure in various tints; and from the abrupt elevation of immense trees, amidst the other comparatively dwarfish productions of the soil, a diversified light and shade are produced, new to those recently arrived in a tropical country.

Succondee is the next place deserving of observation. Here the British and Dutch have settlements. The Dutch fort is erected upon a prominence of micaceous rock of considerable elevation, forming the eastern boundary of a spacious bay.—The British settlement stands at a short distance from the head of this bay in a low and marshy situation. The soil in most parts is a deep and fine absorbent clay; in others, a dark and rich earth; and with the exception of cultivated patches, that are uncommonly fertile, the country is quite uncleared of its luxuriant productions. Insects and reptiles, usually found in hot climates in all very moist soils, are very abundant. The very absorbent nature of the soil along the whole of this part of the country, and its moist state during a great portion of the year, render this place productive of fevers and diseases of the secreting organs.

In our progress towards the eastern part of this coast, we arrive at Commenda, an English fort. It

is placed in a low marshy situation, but the country towards the interior is more elevated. The soil is either wet and swampy, or of a deep and loamy clay.

St. George del Mina is the chief settlement belonging to Holland, and the seat of their African Government. It is the best fortress upon the coast, and is situated on a small peninsula, formed by an inconsiderable river running obliquely into the sea. The immediate vicinity of this fortification and adjoining town is better cultivated than any part upon the coast; even here the Dutch have in some degree pursued their favourite recreation of horticulture. The surrounding country is level, and profusely covered by the usual vegetable productions. The soil is in some places of a light earth, covering a deep, heavy, and tenacious clay; in other places it is a deep clay throughout, of nearly the same kind as is usually met with on this coast. The adjoining native town is populous, and its inhabitants even wealthy.

Cape Coast Castle, the principal settlement belonging to this country, stands upon a very low and insignificant prominence of granite and quartz rocks. The native town is placed near the walls of the castle, between it and the adjoining country. This town is built of the tenacious and heavy clay which forms the soil on which it stands, and the houses are so closely placed to each other, as scarcely to allow a passage between them; during the rainy season every house appears placed in a mire of clay and mud.

In every considerable vacancy, and on the grounds immediately surrounding the town, accumulations of every species of filth would soon take place, did not the moist and warm atmosphere promote its decomposition and carry off the volatilized products, while insects, reptiles, and birds, assist in furthering the same effect. The soil is rather various, in some places it is a rich black earth, in others a brown heavy clay, interspersed by small fragments of mica and

quartz ; but in all places it is uncommonly deep, and exuberant in its wild productions ; from which, with exception of the patches of corn or rice fields under cultivation, it is completely uncleared. There is no river in the vicinity, and consequently the supply of good water is very deficient during the dry season. It then abounds with animalculæ and the noxious gases, disengaged in the low and marshy ravines, from which it is generally obtained.

In our eastern progress along the coast, the next place of importance, to which we will turn our attention, is *Anamaboo*, a fort belonging to this country. It stands upon the sea side, in a very low situation, with a large native town between it and the neighbouring country, which is hilly and covered with clumps of majestic trees, every where surrounded by a dense underwood. The soil does not differ from that we have already mentioned. In travelling along this part of the coast several other forts and settlements, belonging both to this country, to the Danes, and the Dutch, present themselves ; some have been relinquished since the abolition of the slave trade, but all of them are similarly situated with those we have already mentioned, and the soil and aspect of the country continue the same until we arrive at *Accrah*, in 1° east longitude.

The Accrah Country, in which the English, Dutch, and Danes have settlements, is one most extensive and beautiful plain. As far as the sight can reach, not a hill can be seen, unless in days of unusual clearness, very distant mountains may be descried in the interior of the country. This very extensive plain may be considered as one immense meadow of long grass, with occasional picturesque clumps of trees. The unincumbered state of the soil, as well as its peculiar nature, are favourable to cultivation, and the health of both natives and Europeans. The alluvial earth, through the whole of this country, and for

nearly 100 miles eastward, varies from almost a pure sand to a sandy mould, resting upon horizontal strata of primary sandstone, and allowing the rains to percolate and flow along the inferior layers. Owing to this, and the open state of the country, agriculture is more attended to; and endemic diseases, that abound in all the countries we have hitherto described, more seldom occur here. This comparative salubrity of climate induces convalescents from the neighbouring settlements to resort to this place; and the advantages they obtain are most striking. Nor is the different effects of these climates confined to the human species; many of the more perfect animals, such as horses, dogs, &c. which either cannot live for a short time, or enjoy a sickly existence on most parts of this coast, are abundant in this district of country. From the nature of the soil permitting the moisture to find a ready passage through its strata, the sun's rays produce a higher degree of temperature on its surface, and consequently the sea and land-breezes blow in more regular succession. The former is more refreshing, while the latter is infinitely less fraught with the noxious gases.

The greater extent of the Gold coast, with the exception of the beautiful country of Accrah, is of a deep and rich clay soil, covered by an exuberant vegetation and lofty forests. The different European settlements scattered along its margin, are generally erected and retained without regard to salubrity. This is particularly the case with those belonging to this country; most of them being placed in low situations, and either surrounded by, or in the immediate vicinity of, the most fertile sources of malaria. Every breeze must waft it into the apartments of the susceptible tenant. The great depth of the absorbent soil, and its dense verdure and impenetrable underwood, absorb the greater part of the periodical rains; little of it finds its way to the sea, hence the paucity of

rivers along this part of the coast. The rains commence in May, and terminate about the beginning of August. They are afterwards quickly evaporated by a vertical sun from the retentive soil, conveying the gases generated from it and the decaying vegetables. This is very sensibly evinced by a month's continuance of fogs and haze, which always follow this season. The moisture and gases thus produced from the soil, in conjunction with that obtained from the neighbouring ocean, are again precipitated, and constitute what is called the after-rains, which fall about the end of September and in October. The quantity of rain during the year is from 80 to 100 inches. The wind during the first rains always blows from the sea. During the foggy season the air is generally tranquil, owing to the copious evaporation from the earth's surface, after its almost deluged state. This condition of the atmosphere favours the concentration of the noxious elements given off by the soil, &c. and renders it more sultry and oppressive, than is indicated by the actual rise of temperature. Its mean through the whole year does not exceed $83\frac{1}{2}^{\circ}$, generally ranging from 72 to 96° . The barometer does not vary above one-eighth of an inch on either side of 30° .

During the dry season the sea and land-breezes are regular; and on this part of the coast the harmattan, or dry east wind is of frequent occurrence in this season. Its beneficial influence in promoting recovery from all the diseases experienced in this country is always remarkable; nor are its effects confined to promoting recovery, or invigorating the debilitated; epidemics are arrested in the midst of their progress, and even the virus of small-pox will not begin to act upon the system, during its continuance, and if already commenced, the progress will always be favourable.

Throughout the greater part of this district of the

African coast, vegetable productions form the chief source of subsistence. But animal food, although not abundantly supplied them, is still within the reach of the more wealthy, especially in the northern countries embraced by this sketch, and in the richer kingdoms of Akim, Dahomey, and Ayo, that are situated inland, from the eastern extremity of the Gold coast.—The surface of the soil may be considered, generally speaking, as entirely uncultivated. The preparation it receives can scarcely deserve the name of cultivation, nevertheless it seldom fails in producing abundantly from the seeds committed to it; as, however, they only subject to culture what they consider sufficient for their sustenance until the return of the season, a scarcity occasionally happens. This is always the effect of a shorter or longer duration of the rains, and consequently gives rise only to a partial failure in their crops.—According to the soil and situation, they cultivate rice, millet, maize, (*zea mays*,) yams, (*dioscorea bulbifera*,) plantains, (*musa sapientum*,) sweet potatoes, (*convolvulus batatas*,) sweet or innocuous cassada, (*jatropha janipha*;) the poisonous species, (*I. manihot*,) is also cultivated, and is employed in sauces with the *capsicum annum*, or *C. frutescens*, or also with the *anomum grana paradisii*; during the boiling it undergoes in the process, it loses its noxious qualities. Ground-nuts, (*arachis hypogea*,) form another considerable article of food; these grow near the extremity of the root of the plant. In addition to those, we may enumerate the following fruits that are abundant:—Ananas, (*bromelia bananas*,) bananas, (*musa paradisica*,) cocoa-nuts, (*coccoloba nucifera*,) guayavos, (*guayava psidium*,) papaws, (*carica papaya*,) water-melons, (*anguria trilobata*,) limes, (*citrus medica*,) and several species of the tamarind.

After passing along the champaign and open country of Accrah, we arrive at the similarly situated settlements of Prampram and Ningo. The soil on this

part of the coast is light and sandy, and generally open and well cultivated.—Game may be had in tolerable abundance; deer, hares, partridges, guinea-fowls being seen in great numbers. Domestic animals are also much more abundant in this part of the coast. From Ningo a few miles brings us to the Rio Volta, a large river, at the entrance of which the Danes have a fort. Although capacious at the entrance, and so far as it has been navigated, apparently of considerable magnitude, yet the numerous sand banks and rocks at its mouth render it of dangerous navigation. This, as the rest of the large rivers on this part of the coast, abound with crocodiles and hippopotami. The coast to the eastward of this river (frequently received the appellation of the Slave coast,) for many miles retains nearly the same species of soil with that just mentioned. This country formerly possessed two settlements on this part of the coast, in the dominions of the King of Dahomey; they were relinquished after the abolition of the slave trade.

The Slave Coast commences at Rio Volta, and extends to the Bay of Biafra, in lat. 3° north and $7\frac{1}{2}^{\circ}$ east longitude.—The whole of this coast is remarkably low and swampy, and deeply indented by creeks, and the capacious but often shoaly mouths of the large rivers that flow into this part of the Gulf of Guinea. The most remarkable of these are the Formosa, old and new Calabar, and the Cross and del Rey rivers. According to Reichard, these are different mouths of the Niger, by which it disembogues itself into the Atlantic. These rivers flow through the extensive kingdoms of Benin, Warree, and Biafra, and are navigable to a considerable distance from their entrance. Owing to the extensive traffic carried on with the different States in their vicinity, in palm oil, ivory and ebony, &c. given in exchange for British manufactures; and to the facilities which they afford to the native traders from the more inland States, for the

transport of their commodities, these rivers are more frequented than any on this coast. Their banks, however, are so swampy, and the soil in general so richly wooded, as to render commercial speculation an undertaking of surprising enterprise on the part of Europeans, constituting the crews of vessels proceeding to this country. We believe half of those who proceed on such a voyage never return; and we have known instances of one-fourth only surviving their short stay in this climate. The necessity for vessels proceeding some distance up these rivers, in order to enter upon the field of traffic, necessarily brings them within the sphere of action of the malaria generated from the mud, ooze, and decaying vegetables, which continually cover their banks. These sources of disease are greatly multiplied, both during and after the rainy season, from the nearly inundated state of the country, and by the sultry and stagnant state of the atmosphere. The diseases which prove so fatal to the crews of vessels, (who are the only visitors of this country,) are continued and remittent fevers, dysentery, and cholera morbus. The unhappy victim of disease may consider himself so far fortunate, if he escape with an attack of one of these only; not unfrequently dysentery carries off the individual whom fever had spared. The soil in this part of the coast is generally a muddy clay. The district that adjoins the Gold Coast, and forms a part of the kingdom of Dahomey, is more open; and the soil is generally sandy, or varying from that to a gravelly clay. The quantity of rain, and the rise of temperature, may be considered the same here as in the countries previously described. The sea-breezes are neither so strong nor so regular in succession on this part of the coast as in most of its divisions, already mentioned.

From the account we have attempted to give of this part of the African coast, our readers must be struck by the sameness of aspect, which the whole of

it affords. This, as may naturally be supposed, gives rise to a similar uniformity in the character of the diseases to which Europeans, either lately arrived, or for a considerable time resident in it, are subject. These, as may be expected, vary according to the time of residence, the intensity of the causes, and individual circumstances of the patient.

We shall conclude this article with a few brief observations on the more fatal diseases of the country—fevers and dysentery. Those who arrive in this country are subject, within the first nine months, and more frequently within as many weeks, to the endemic yellow fever, to bilious diarrhœa, to cholera morbus, and dysentery. If a bilious diarrhœa or cholera precede an attack of fever in the new comer, (or what is usually called the seasoning,) of a tolerably sound constitution, both diseases may be comparatively mild.

Fever is the disease which produces the greatest degree of mortality, and may attack new comers at all periods of the year. Nor do residents remain long without suffering from its visits, although under a different type. When unacclimatés, of a phlegmatic or melancholic temperament, are subjected to the causes of the disease in considerable concentration, the vital energy may be so completely overwhelmed as to be incapable of reaction, and none of the symptoms of that stage of the disease can be discernible. In such cases the frame of the subject, in the space of from one to five days, sinks into dissolution, exhibiting a liquescent form of fever; the body being semi-putrescent, even before vitality has entirely relinquished her seat. In those of a full habit, of a strong muscular formation, or of the sanguine or irritable temperaments, violent symptoms of reaction rapidly supervene to those which indicated the stage of invasion; these, if not arrested by judicious treatment, exhaust the vital energy in a period proportionately

to their degree of intensity, and the resistance made by the constitution. This consequent exhaustion may be so great as to be incompatible with the continuance of life; or some important organ may, during the height of the excitement, suffer in such a manner as to put a speedy stop to the vital relations of the system. Either of these effects may individually operate in producing death, or they may combine in being its more immediate cause. In long residents the fevers that terminate fatally are generally of a remittent type; in them, the changes wrought upon the system, previous to the last and grand change, are seldom so simple; along with considerable exhaustion of the vital energy, there is always present considerable visceral disease. Intermittents are common among the acclimatés, and often induce visceral disease.

Dysentery is more frequent upon the Gold coast than on any other part. This may be owing to the scarcity of good water. The mode of living has also a considerable share in giving rise to this disease. In new comers it is chiefly confined to the mucous membrane of the colon and rectum, with increased action of the muscular fibres, especially the longitudinal fasciculi; these contract the colon into cells, and from being considerably shorter than the intestines, even in the healthy state, this viscus is drawn into folds that meet those of the opposite side; thus forming complete valves against the further progress of the contents, or of the matters thrown into this by the small intestines.*

* We have met with the pure idiopathic cases of this disease, in which no derangement was visible in the liver. We consider the exclusive manner of treating dysentery with mercury, recommended by many, as evincing narrow views of pathology, inasmuch as it attributes its origin to diseased secretion of the liver. We do not doubt, that both diseases may take place simultaneously, or the one supervene on the other; and thus both may be prolonged or

In unacclimatés this disease is more acute, and generally requires depletion, with medicines calculated to allay the irritation and spasm, constituting some of the leading symptoms of the disease. Irritating purgatives, &c. only tend to prolong the disease. In long residents it is generally combined with considerable disease in the liver and spleen, and then not unfrequently assumes the chronic form; such a complication will consequently point out the treatment. Our limits prevent us from taking a view of the other but less prevalent diseases.

Among the natives fever seldom appears; they are not however, exempt from its attack. It generally assumes an ephemeral form, and is frequently complained of according to the organ chiefly affected, as when the head, stomach, or bowels become considerably deranged through the course of the febrile action. Fever, however, sometimes commences, and runs through the regular stages, without any particular organ suffering the onus of disease; but the different stages are always of shorter duration in them than in Europeans; and the action of the heart becomes more rapidly increased. During the course of the excitement, it more frequently is the case that some particular organ or tissue suffers in such a manner as to arrest the attention of both patient and physician to that alone. Dysentery is of frequent

exalted, either individually or conjunctly. Of this we have seen proofs, established by post mortem inspection. We also disagree with those, especially our continental brethren, who consider dysentery as a colonitis. That there is inflammation of the mucus membrane of this intestine, frequently extending along the rectum on one side, and to the small intestines on the other, we grant; but there are also an irritable state and spasmodic action existing in the muscular fibres, and were inflammation also existing in them, these in our opinion, could not take place. The inflammation no doubt extends to the cellular tissue connecting both coats, and in its progress in this connecting membrane detaches the mucous tissue.—*Reviewer.*

occurrence among them, and often assumes an epidemic character.

During the course of this hasty sketch, our readers cannot fail of perceiving from the nature of the soil and its productions, from the topography and climate of the country, that it must be productive of the sources of these endemic diseases.

To trace the effects of those causes upon the frame—to inquire by experiment and observation into the series of causes and effects, as they are sensibly developed in the system, as well as into their primary mode of action—were the objects that chiefly led us to encounter a climate, in which no one could be placed a night without danger. 'These inquiries will be soon laid before our brethren: we have only to regret that no facilities were afforded us for extending them as we could have wished; but, notwithstanding, we have some reason to be satisfied with the result.'—*Foreign Journal*.

I have introduced the foregoing.

WESTERN HEMISPHERE.



ON YELLOW FEVER.

The disease which I am now to consider has no common claims to the attention of the Medical Philosopher.—The extent and frequency of its epidemical visitations;—its fatal tendency and rapid career;—and the merciless selection of the more robust and healthy as its legitimate prey,—are circumstances in the history of Yellow Fever, which cannot fail to command a deep feeling of interest in the investigation of its origin and nature.

Much light has, of late years, been thrown on this subject by the contributions of various practitioners in the public service, who have meritoriously employed a portion of their retirement subsequent to the war, in giving to the world the sum of their observation and experience. It is to be regretted, however, that an increased familiarity with the scenes of woe, has not produced a corresponding unison of sentiment in regard to the ætiology of the disease from which those events have sprung:—It may even be said, that no question in medical science has been more keenly agitated than that of the contagious or non-contagious origin of Yellow Fever. The discussion of this point will be brought forward hereafter. Omitting the names of the older writers, I shall here confine myself to a brief enumeration of the principal of those who have subsequently published their opinions in favour of, or in opposition to the doctrine of contagion, without, however, aiming at giving a complete list, or of being scrupulously exact as to the priority of their respective publications. In favour of the conta-

gious nature of Yellow Fever, we have the authority of Lind, Blane, William Wright, Chisholm, W. Currie, Thomas, Pugnet, Bally, Gonzales, Pym and Fellowes. On the other hand, in the list of authorities who consider it as not contagious, are included the names of Hunter, Jackson, Moseley, Rush, Miller, Bancroft, Lempriere, Devèze, Saverésy, Valentin, Dickson, Mc Arthur, Burnett, Doughty, Veitch, Ferguson, Dickinson, Mortimer, Sheppard, Robertson, &c. It will be seen that, numerically, the advantage is greatly on the side of the latter; and it is but candid to admit that, in opportunities, also, the preponderance is still more in favour of the non-contagionists, many of whom, for a series of years, held official situations in the West Indies which afforded them ample means of observing this fatal disease, in various places, and in all its forms.

I shall first lay before my readers copious reviews of the essay and sequel of Dr. Bancroft on Yellow Fever, which will be found to include a full discussion of the controverted points; to these will succeed two philosophical papers by Drs. Dickson and Ferguson; and the subject will be concluded by the correct and valuable histories and methods of treatment of this formidable endemic by Dr. Mc Arthur and Mr. Dickinson. The department will thus, I trust, be found to present a comprehensive *exposé* of the opinions of the most recent writers on Yellow Fever; of whom it is but justice to add, that their acknowledged abilities and ample experience in this disease, are sure pledges of the importance and accuracy of whatever proceeds from their pens.

An Essay on the Disease called YELLOW FEVER, with observations concerning Febrile Contagion, Typhus Fever, Dysentery, and the Plague; partly delivered as the Gulstonian Lectures, before the College of Physicians, in the Years 1806 and 1807. By EDWARD NATHANIEL BANCROFT, M. D. Fellow of the Royal College of Physicians, Physician to the Army, and late Physician to St. George's Hospital. London, 1811, pp. 811.

SEC. I.—Dr. Bancroft having, in the year 1806, been appointed to deliver the Gulstonian Lectures before the College of Physicians, made choice of the Yellow Fever as the subject for that occasion; and certainly no subject can be more interesting than Fever, the nature and causes of which are still involved in so much obscurity, and in the medical treatment of which disease we are still so far from being universally successful, that every attempt to add to our knowledge, and improve our treatment of so dreadful a scourge to mankind, deserves to be received with thankfulness and examined with candour.

The Essay on Yellow Fever is divided into four parts; the first of which contains observations on the Symptoms and Mode of Treatment. Previous, however, to giving a detail of the history and progress of the disease, the author enters into a discussion respecting the propriety of its present name. This is derived from one particular symptom, the colour of the skin; pretty general, indeed, but not universal, nor even essential to the existence of the disease, nor proportioned to the magnitude of its violence and danger. Were the name of the disease to be derived from a single symptom only, the author thinks *Causus* would be a more appropriate title; not only as a burning heat of the skin occurs more generally than yellowness of it, but because also the degree of heat ex-

isting, affords some indication for the successful treatment of the disease. A great objection that may be urged against both these names is, that these symptoms occur in various degrees in most other fevers, and are not characteristic of the nature and properties of any one. The fever in question has been called by Sauvages *Typhus icterodes*, but it is not generally connected with any morbid state of the liver or the bile; by Cullen, *Typhus cum flavedine cutis*; by the French, *Maladie de Siam*, and *Fievre Matelotte*; by the Spaniards, *Chapetonada*, and *Vomito prieto*; the latter of which names the author thinks equally objectionable with Yellow Fever, since neither the black vomit nor yellowness is universally present, nor peculiar to this disease. Sporadic fevers, occurring in very warm climates from any accidental cause, are, the author observes, liable to be accompanied with the same severe and fatal symptoms which occur in the epidemic yellow fever, and have accordingly been confounded with this latter. They are to be distinguished, first, by the causes of the former being generally some excess, over-fatigue, taking cold, or affections of the mind, operating therefore on a few individuals only; while the causes of the latter are of a more general nature, and operate on a considerable number of persons at the same time: Secondly, by their progress; the first being always of a continued type, the latter almost always manifesting a disposition to remit. It is of the epidemic disease the author principally treats, although his observations are equally applicable to both diseases.

There is reason, however, to apprehend, as frequently happens in nosological arrangements, that the above distinction of type is rather artificial than founded in nature. In the plethoric stranger, and in arid situations, the Fever is usually ardent and continued; while in those who have resided some time in the climate, whose systems are reduced from a

state of high health and European vigour, and in uncleared woody places, it frequently assumes the remittent form: in other words, the type will much depend on the habit of the patient, season, locality, and the nature and intensity of the peculiarly exciting cause.

Symptoms. As the attack and progress of these are well described by the author, I shall give them in his own words.

“The progress and violence of the yellow fever differ greatly, according to the force of its cause, the vigour and excitability of the patient, and the season of the year. When it prevails epidemically in hot climates, and attacks young and robust men, lately arrived from temperate regions, the disorder commonly appears in its most aggravated form. In this, the patient first complains of lassitude, restlessness, slight sensations of cold and nausea, which symptoms are soon succeeded by strong arterial action, intense heat, flushing of the face, redness of the eyes, great pain and throbbing in the head and in the eye-balls, uneasiness and pain in the stomach, oppression of the præcordia, a white fur on the tongue, and a dry parched skin, with a quick, full, tense, and generally strong pulse, though it is sometimes oppressed and irregular. These symptoms are speedily accompanied by frequent efforts to vomit, especially after swallowing food or drink, with discharges, first of such matters as the stomach happens to contain, and afterwards of considerable quantities of bile, appearing first yellow and then green, sometimes tinged with blood, but in the progress of the disorder with matters of darker colours; an increase of pain, heat, and soreness at the præcordia, also occurs, with constant wakefulness, and frequently with delirium, more or less violent. This paroxysm, or exacerbation, which has been called the inflammatory, or the febrile stage, generally lasts thirty-six hours, but is some-

times protracted for seventy-two hours, and even longer, probably in consequence of either general or local inflammation, (particularly in the brain or stomach,) or of irregularity in the circulation, which are known to prolong the paroxysms in fevers of type.

“A remission then occurs, in which many of the symptoms subside, so often as to induce a belief that the fever is at an end, and recovery about to take place. Frequently, however the foundations of irreparable injury to the brain or stomach have already been laid in the former paroxysm; and in such cases the remission is short and imperfect. During these remissions, the pulse often returns apparently to the condition of health, the skin feels cool and moist, and the intellect, if previously disturbed, sometimes becomes clear; sometimes, however, the patient remains in a quiet and stupid state, a symptom generally denoting great danger.—Another sign of danger, as denoting a very morbid condition of the stomach, is the renewal of the efforts to vomit, when pressure is made on that organ, or food is swallowed. After a certain interval, this remitting stage is succeeded by another, which may be called a second paroxysm, and which, probably, would appear as a renewed exacerbation, if the violent effects of the first had not almost exhausted the patient's excitability, and in conjunction with the extreme depression of strength which usually attends inflammation of the brain or stomach, rendered him nearly unsusceptible of those morbid actions which are necessary for that purpose.—In this latter stage, then, instead of great febrile heat, and strong arterial action, the warmth of the body, and the frequency and strength of the pulse, are often less than when the patient was in health; but frequently the pain and heat in the stomach become excruciating, with incessant strainings to vomit, which in most of the fatal cases, are followed by hiccough, and repeat-

ed discharges of matters resembling turbid coffee, more or less diluted, or the grounds of coffee, and also by evacuations of similar dark matters from the bowels. Here it is to be observed, that when these symptoms occur, (indicating a violent affection of the stomach and bowels,) the patient is, in general, sufficiently in possession of his intellects to know those about him, and to give distinct answers to questions made to him, although his excessive weakness often renders him incapable of mental exertion, and his inability even to raise his head, may induce the appearance of coma. In those cases, however, in which the brain has suffered greater injury than the stomach, the retching and black vomit, just described, do not so commonly occur, but, instead of them, low muttering, or coma, with convulsions of the muscles of the face, and other parts of the body, supervene. About this time, also the tongue and teeth are covered with a dark brown fur; yellowness of the skin and petechiæ make their appearance; the urine, when passed, has a putrid smell and dark colour; the fæces likewise become most offensively putrid; hæmorrhages sometimes take place from the nostrils, gums, and various other internal surfaces; there is in some patients, a suppression of urine; in others an involuntary discharge of it, and of the fæces: the pulse becomes feeble and intermits; the breathing is laborious; portions of the skin assume a livid colour; the extremities grow cold; and life is gradually extinguished."

The above description of the disease accords with the distinction which the author has attempted to establish; but as he is here delineating the most severe and fatal form of yellow fever, the propriety of characterizing the subsidence of great heat and vascular action at the close of the first stage as "a remission," is very questionable. It is, in fact, the transition from inordinate action to exhaustion—to that almost

hopeless state which, (the foundation of almost irreparable mischief having been already laid in the most important viscera,) is speedily to terminate in disorganization and death, and has nothing in it of the salutary tendency of a remission. As Dr. Gillespie observes, "it is proper to caution young practitioners against a mistake very common with regard to the yellow, or ardent fever; that is, of taking the fatal stage which follows the cessation of ardent heat and great excitement, and which accompanies a sphacelus of the viscera, for a salutary crisis of the disease."—*Diseases of Seamen.* "Cette diminution des symptômes en impose quelquefois au malade, et meme aux médecins in expérimentés."—*Dict. des Sciences Medicales*—tome xv. p. 336.

This declension of fever at the close of the first stage excited early attention, and is often so marked as to have been frequently mistaken for a proof of returning health. It is noticed by Dr. Hume, who had the charge of the naval hospital at Jamaica between the years 1739 and 1749, and was afterwards a Commissioner of the Sick and Hurt Board, in the following terms: "The pulse is at first full, quick, and strong, but in forty-eight hours after seizure, or thereabouts, it sometimes becomes calm and regular, scarce to be distinguished from the pulse of a person in health."—See *Dr. Hume's Account of the Yellow Fever*, published by Dr. Donald Munro.

The preceding, (says Dr. Bancroft,) is a description of the disease in its most violent form, and it sometimes proceeds with such rapidity as to destroy the patient on the third or fourth day, or even sooner. It seldom happens that in the most severe cases the head and the stomach are both equally affected; one of those organs however generally suffers such derangement as to destroy the patient. Those who die early in the disease appear to perish from an affection of the head, with less vomiting, whereas those who

have the stomach more violently affected, are usually found to have their mental faculties clear though much weakened ; and they seldom expire before the end of the fourth, or the beginning of the fifth day, p. 17.

The *dissections* of patients dying of this fever have discovered appearances correspondent to the affection of the part most violently attacked by the disease.—Where the affection of the head has formed the principal feature of the disorder, the integuments of the brain have generally been found more or less inflamed, especially near the temporal bones ; the vessels of the dura mater and of the pia mater were not unfrequently observed to be very turgid with blood, which was also sometimes extravasated. Effusions of watery fluid have likewise been seen over the surface of the brain, or in vesicles between the pia mater and the tunica arachnoidea. In some cases the integuments have been so firmly attached to each other, and to the brain, that in attempting to raise, or separate them, a part of the substance of the brain has been torn up. The volume of the brain is often increased, and the substance of it is, in some instances, more firm than usual ; when cut, the vessels distributed through it have been so distended with blood, that the medullary part has immediately become thickly spotted with red points, owing to the oozing of blood from the divided vessels ; and it was not rare to find that some of those vessels had been ruptured, and that blood had escaped into the substance of the brain. The ventricles usually contained water, of a yellow colour, and were in some cases quite filled with it. The plexus choroides has often been loaded with blood.

In those cases of the disease where the symptoms indicating a severe affection of the stomach have been predominant, inflammation of that viscus has been discovered upon dissection. In some cases, almost the whole inner surface was inflamed ; very often por-

tions of the villous coat were abraded, nor unfrequently observed floating among the contents of that viscus. Marks of inflammation, but less violent than these, have also been often seen in the smaller intestines, especially near the pylorus. The inflammation seems to be of the kind denominated erythematic; this kind of inflammation is apt to spread, the author observes, wherever there is a continuity of membrane or of structure; and as such continuity exists through the whole alimentary canal, the viscera nearest to the stomach must be liable to participate in the inflammatory affection of the latter.

The *Black Vomit* is so universal a symptom in severe cases of yellow fever, that it becomes an important object to ascertain its source and origin. Many writers have attributed it to a superabundant and altered secretion of bile, but certainly without foundation, as is evident from the facts stated by our author, both from his own observation and that of several other physicians. In the greater number of dissections the liver has been found in a healthy state, and where it has differed from its natural appearance, it has frequently been of a paler colour; the gall-bladder has also at the same time been found in a healthy state, containing its usual quantity of bile, not at all altered in its appearance or properties.

At a time when the stomach has been distended with black vomit, the passage from the duodenum into the stomach has been completely obstructed by the pylorus valve, so that no portion of the matter could have been derived from the hepatic system, in every part of which system the bile was quite natural in colour, taste, and consistence. The matter of black vomit, compared with bile, differs materially from it in all its physical qualities; "it differs from it in colour; for however dark the bile may appear in its most concentrated state, it always displays a yellowish, or greenish yellow tinge, when spread on a white

surface, or when diluted ; and this is never observed with the matter of black vomit. It has also been found that an addition of bile to the latter, altered its nature so much as to give it an appearance different from what it had before ; nor could the black vomit be imitated by any mixture of various proportions of dark-coloured bile with the fluids found in the stomach. It differs most decidedly in taste ; the black vomit being always insipid, when freed from other foreign matters, whereas the bile can never, by any means, be deprived of intense bitterness.”

If then the black vomit is not bile in a morbid state, nor contains any portion of that fluid, whence is it derived ? It must proceed from the stomach itself, and appears to be, in most cases, a consequence of inflammation of that viscus. Some physicians have entertained an opinion that the black vomit is a particular morbid secretion by the inflamed vessels or glands of the stomach ; Dr. Bancroft thinks, that “ it is merely blood which has been effused from some of the small arteries, ruptured in consequence of the separation of certain portions of the villous coat, and has coagulated within the general cavity of the stomach, or on the surface over which it was effused ; and having been afterwards detached and triturated by the violent and frequent contractions of that organ in the efforts to vomit, has had its appearance as a coagulum of blood altered, and its colour darkened by the gastric juice, or by some chemical decomposition, either spontaneous, or produced by the action of the air, or other matters contained in the stomach.” In confirmation of this opinion it is stated that in many cases, portions of the inner surface of the stomach have been covered with a coat of thick blackish matter, and upon removing this coat, the parts beneath it, and no other, were found inflamed. The substance thus obtained was exactly similar to black vomit, and there is reason to believe that it

must have been derived from the vessels of the inflamed part. At those spots moreover, where the villous coat had been abraded, the extremities of arteries have been frequently seen filled with this dark coloured matter; and collections of the same matter have even been discovered immediately under the villous coat. A relaxation of the vessels of the stomach may give rise to hæmorrhage from that viscus, as we find happens in some cases of extreme debility, and, probably, this may take place in some very few instances of yellow fever, where the coats of the stomach remain entire; but the author concludes, with great reason, “that the black vomit is much less frequently the consequence of a relaxation of vessels, than of a separation of some portions of the internal coats of the stomach.”

The *Affections of the Skin* in this disease are in some respects similar to those which take place in other fevers; during the strong arterial action which succeeds the first attack, the skin becomes excessively dry and parched, with an intensely burning or pungent heat. Sweats are in this stage a very rare occurrence; and when they do appear, no relief is afforded by them. A feeling of general soreness of the skin also takes place in many patients. Of the yellow suffusion, which has given name to the disease, we have the following description:

“The yellowness begins in a few cases, within the first forty-eight hours; sometimes on the third day, and frequently not until the fourth or fifth. It is, indeed, sometimes observed but a few minutes before, or a little after death. I believe, that in many instances it might, with attention, be discovered on the eyes; but it is commonly first observed on the cheeks, extending towards the temples, and about the angles of the nose and mouth; about the lower jaw and on the neck, along the course of the jugular veins, whence it afterwards spreads in stripes and patches

along the breast and back, downwards, so as at last to become universal in some patients, though in others it remains partial. The yellowness is sometimes of a dingy or brownish hue, sometimes of a pale lemon, and at others, of a full orange colour. When the yellowness appears only in patches or spots, and of a dingy or brownish hue, these are frequently intermixed with other spots of a florid red, or a purple, or livid colour."

This yellowness of the skin is, with one partial exception, derived from the bile; and the manner of its entrance into the blood-vessels is thus accounted for by the author. "When there has been very frequent and violent vomiting for some length of time, the stomach, diaphragm, and abdominal muscles, are apt to become irritable to an extreme degree, so that at each effort of the former to discharge its contents, the latter will frequently be thrown instantaneously into strong spasmodic contractions, and the liver, together with the gall-bladder, will be as it were suddenly caught, and tightly squeezed in a powerful press; the necessary consequence of which pressure seems to be, that all the fluids contained in that viscus will be driven towards both extremities, backwards as well as forwards, in those vessels which are not provided with valves to prevent their retrograde motion. Under such circumstances it can scarcely be doubted, that the bile will be forced to regurgitate in this manner, and pass from those ducts into the vena cava at each violent compression of the liver; and that by continued and strong spasmodic contractions of the before-mentioned muscles in vomiting, a considerable quantity of bile may be carried into the circulation, and a yellow suffusion resembling jaundice be very speedily produced."

In this manner also is the yellowness of the skin accounted for which succeeds from the bite of venomous reptiles, and the poisoning by some species of

mushrooms, and certain poisonous fishes; in all which cases, violent convulsive vomiting is a usual symptom. The exception to the yellow suffusion being derived from the bile, refers to those cases in which the yellowness of the skin occurs partially, or *in patches* or spots; in these instances it is thought to be produced by a cause similar to that which produces the yellowness that follows ecchymosis, and to be connected with that particular state of the blood and of the vessels which gives rise to hæmorrhages from various parts of the body, external and internal. It is accordingly in these last cases that extreme danger is more certainly indicated, than in the general suffusion arising from compression of the liver.

Having given Dr. Bancroft's account of the Black Vomit and the Yellow Suffusion, I may remark that his explanation of the nature and origin of the former, (though somewhat different from the view of Dr. Jackson in his sketch of the history and cure of febrile diseases, p. 63-4,) nearly coincides with that of other accurate observers of the phenomena of the disease and the appearances on dissection.*

With respect to the yellowness of the skin, Dr. Bancroft's explanation is not quite so satisfactory. Drs. Dickson and Mc. Arthur both inform me, that they have occasionally seen this symptom, previous to the occurrence of vomiting; as well as in cases, where from great attention to allay the gastric irritability, or other causes, as when the head is greatly or chiefly affected, but little vomiting comparatively, had occurred in the course of the disease; and Mr. Dickinson, in his work, also remarks, "that vomiting does not

* See Dr. Bancroft's appendix, No. I, containing "Observations on the Black Vomit," by Dr. Physic, and Dr. Ffirth, extracted from the New York Medical Repository, vol. 5th, p. 129, and Dr. Cox's Medical Museum, vol. 1st. p. 116-118, also Dr. Mc. Arthur's account in the subsequent pages.

always precede, nor does it always occurs when the bilious suffusion takes place," p. 171.

That of Broussais appears the more correct exposition. He is of opinion that the yellow colour depends solely on the violent irritation of the duodenum, which is propagated to the secretory organ of the bile; that all the other symptoms of this fever are those of inflammation of the stomach and small intestines; and that the researches of Pugnet, Tommasini, Dubrieul, and many others, have no doubt of the correctness of this determination respecting the seat of the disease.

The yellow dingy patches in the advanced stage, which our author considers an exception, produced by a cause similar to the yellowness following ecchymosis, and probably connected with that peculiar state of the blood and loss of power in the smaller vessels which gives rise to passive hæmorrhage, is indicative of the worst stage of the disorder; and is probably dependent on the peculiarly unfavourable habit, or deleterious nature of the exciting cause, and sometimes on the previous treatment of the patient.

The yellow fever has, by several authors and practitioners, been confounded with the Plague as well as with Typhus, from both of which it essentially differs. Reserving for discussion in another part of the volume the question, whether yellow fever, like the others, can be propagated by contagion; the author next lays down several *diagnostic signs* by which these diseases are to be distinguished from each other: the yellow fever differs from the plague, in that it prevails only in those countries, and in those seasons, in which the heat is, or has recently been, so great as would destroy or stop the progress of the plague; in the intertropical climates, therefore, so favourable to the existence of the yellow fever, the plague is not at all known. The glandular and cutaneous affections, called buboes and carbuncles, so constantly accompa-

nying the plague, are not found to exist in the yellow fever. A violent febrile paroxysm is essential to the character of yellow fever, whilst, according to the best authority, persons have been attacked with the plague without having the least febrile affection, as sometimes happens in small-pox, scarlet fever, and measles. Blacks are very rarely seized with the yellow fever; and when seized are much less violently affected by it than Whites, living under the same circumstances; whereas they are not less susceptible than Whites of the plague, and die of it in a far greater proportion.

“ Yellow fever differs from typhus in the following circumstances, viz. it prevails, as I have already mentioned, only during, or immediately after, very hot seasons, in which typhus is soon extinguished; and it is, in its turn, completely extinguished upon the accession of cold weather, in which typhus is commonly most prevalent; it attacks most readily and most violently the young and robust, over whom typhus is allowed to have the least power; it begins with much greater exertions of the living power than typhus; is attended with many different symptoms, and terminates much sooner; it is, besides, disposed to remit, and it frequently changes into a regular remittent, and sometimes even into an intermittent fever, which true typhus is never observed to do.”

Having thus given a general outline of the symptoms and progress of the disease, the author proceeds to a consideration of the various remedies proposed for its cure, and offers some observations on the propriety and utility of each.

Bleeding.—A great contrariety of opinion, the author observes, has subsisted on the subject of *bleeding* in yellow fever; some considering it as an indispensable remedy, and others alleging, that nearly all who were bled had died. Independently of actual experience, several circumstances attending this disease ap-

pear to render it probable, that the evacuation of blood would be serviceable to the patients labouring under it. This fever, especially the violent forms of it, seldom occur among any other persons than strangers recently arrived from temperate climates; the greater part of whom will commonly be found to be young, robust and vigorous. In its first stage it is frequently accompanied with a very considerable degree of general inflammation, (which is, the author thinks, perhaps greater than in any other kind of fever,) indicated by a hard, full and strong pulse; the distressing sense of universal distension, the red, starting, watery eye, and the parched skin. Those who have fallen victims to the disease have generally exhibited, on dissection, signs of considerable inflammation in various organs, and especially in the head and stomach. That the duration of a paroxysm of fever is lengthened, and its distressing consequences augmented by general inflammation, is well ascertained by experience, and no method is so likely to obviate these as bleeding. To render it beneficial it should be resorted to very early, (as within 24 hours, or even twelve, if possible, from the attack;) and to prove effectual, it should be performed copiously, from a large orifice, soon after general inflammatory action is perceived; more benefit arising from taking away a large quantity of blood at once, than by a larger evacuation at two or more bleedings. The propriety of the evacuation being made at all, however, and the quantity of blood to be taken, must be determined by the circumstances of each patient.

The above recommendation of blood-letting, is feeble when compared with that of several other modern authors, but I am not disposed to cavil with the writer on this account, or to place my faith too exclusively in any remedy; for in different epidemics and states of the constitution, the same measure will be followed with very different results.—There can be no doubt,

however, that in so powerful a disease, our hopes must chiefly rest on powerful means ; and that in the class of subjects generally selected by this fever, the young and robust, the lancet should be used with a bold hand. But it should be ever kept in mind, that the chance of success will almost entirely depend upon its being used within a few hours after the commencement of the attack. When employed too late, it will certainly hasten, though it may smooth, the passage to the grave,—for it has often been observed that patients who had been bled died with much less suffering than those who had not undergone this operation.

Cold Water is, our author thinks, a very efficacious remedy in the yellow fever ; and when applied externally, affords very great relief to the feelings of the patient, who is frequently distressed with a sensation of burning heat ; the temperature of the skin, at the same time, being actually raised so much as four degrees of Fahrenheit's thermometer above the natural standard. It is only when the heat of the body is above the natural standard that cold water should be applied externally ; and the period of its application, and the frequency of its repetition, must generally be determined by the feelings of the patient ; for, should he become chilled by it, much mischief might ensue. To avoid the fatigue to the patient, which the usual mode of applying this remedy is apt to induce, the author recommends, as a useful substitute, that he should be covered, as he lies in bed, with a single sheet wetted with cold water, which, by evaporation, will gradually reduce the temperature of his body to a proper standard.

Notwithstanding this caution, the affusion of cold water in the first stage is by much the best and most efficacious mode of proceeding ; but as the disease advances, aspersion, or ablution, may be substituted with advantage, for then the shock might be injurious,

and the object is to allay morbid heat and febrile irritation.

The author is of opinion that much benefit also arises from cold water taken internally as drink; small quantities of which, frequently repeated, he has observed to moderate the excessive heat of body, as well as the violence of general febrile action; it is efficacious likewise in disposing the skin to perspire gently, and in preventing inflammation of the stomach, or diminishing and removing it after it had been excited. The author's experience is confirmed by that of several other practitioners; and the general utility of cold drinks in fevers has been acknowledged by all physicians, ancient as well as modern, while the author thinks it has been too seldom employed by British and American physicians in their treatment of yellow fever.

Purgatives are proper to obviate that state of costiveness which frequently precedes, and generally accompanies, yellow fever; they should be such as will not offend or irritate the stomach by their bulk or quality; the author appears rather to employ them for the purpose of preventing an accumulation of fæcal matters, which might produce morbid irritability in the whole intestinal canal, and aggravate other symptoms, than as means of carrying off the fever, as has been proposed by Dr. Hamilton in the fevers of this country.

Here, also, the author is too sparing in his approbation of so valuable an auxiliary as purgatives; though he very properly recommends such as will not offend the stomach by their bulk or quality. Full doses of calomel combined with jalap, compound extract of Colocynth, &c. assisted by enemata, if necessary, should be given so as to insure early free evacuations—nor should we rest until this object be obtained; and such quantities of medicines of this class should be repeated during the course of the disease as will obtain two or more motions daily.

Emetics are very properly reprobated by Dr. Bancroft in the yellow fever, on the grounds that gastric irritability is usually a very early symptom—one of the most difficult to allay—and of the most dangerous tendency. So far from being removed it is too invariably aggravated by the use of emetics; as indeed must be expected when the irritability of this organ, instead of being caused by bile, undigested aliment, or other offending matter, originates from sympathy with the morbid condition of the brain or of the surface, or, as is too often the case, from rising inflammation in the coats of the stomach itself. Neither, observes our author, are their pernicious effects confined to this viscus, for the violent efforts to vomit exhaust the strength and propel a larger quantity of blood to the brain, already suffering from undue excitation. Instead of increasing, therefore, the object is to calm and allay the irritation of the stomach as much as possible; and the most likely method of effecting this indication is by an active and judicious employment of such means as lessen the general fever and local inflammatory action—by keeping the bowels freely open, by abstracting morbid heat from the surface, by avoiding the irritation of distension from drink or medicine, and by the counter irritation of a large blister over the epigastrium. With the same view Dr. B. has tried small doses of opium, as half a grain, at intervals, but though it might succeed in allaying a slight degree of gastric irritability, the utility of opium is not only very questionable, but in the early stage, or in a high state of vascular or cerebral excitement it must prove decidedly injurious.

Sudorifics are also justly disapproved of by Dr. Bancroft, as tending to increase that disposition to vomit, from which the greatest danger is to be apprehended. The preparations of antimony, especially, too often leave behind them a degree of gastric irri-

tability which resists all our endeavours to appease it, and there can be no doubt that by aiding this formidable symptom, they have been too frequently employed to the irreparable injury of the patient, while the intention with which they are exhibited cannot be effected by such means. For this purpose saline draughts in a state of effervescence, and other mild febrifuges, may be used ; but the most effectual mode of restoring the natural functions of the surface, is by cold or tepid affusion, or ablution, and such other measures as lessen morbid heat, and febrile action.

The Peruvian Bark, Dr. B. thinks, may be exhibited as soon as the febrile commotion subsides ; but, like opium, the early use of cinchona is of very questionable propriety : there will be a risk of its reproducing vomiting if it has subsided, and if it continues, any attempt to make bark remain upon the stomach is equally hopeless and objectionable. Indeed, Dr. B.'s caution not to give it "when there is a parched skin, a hard pulse, a dry tongue, great heat and pain at the stomach, or delirium," is tantamount to a prohibition in a vast majority of instances ; for too often are some of those or other dangerous symptoms, where it is equally inadmissible, the very difficulties with which we have to contend.

These observations, however, chiefly apply to the ardent continued form of yellow fever. For in cases where decided remissions are observed, in marshy situations, and in habits reduced by long residence or otherwise ; in fine, where the febrile movements are neither of the same rapidity, nor inflammatory tendency, the bark is often of the greatest service, and is chiefly depended upon in the French, and some of the other Islands, most fruitful in vegetable life and decay. When the violence of the first stage is passed, and the patient is rapidly merging in a state of great exhaustion and depression of the nervous ener-

gy and vital power, cordials and stimulants, as wine, or even spirit diluted, ammonia, capsicum, &c. are to be resorted to; and small quantities of some bland nutritious matter should be cautiously but assiduously administered. But instead of attempting to do too much in the advanced period, we should carefully remember, that it is only in the first and inflammatory stage, and soon after its onset, that we can hope by active measures either to subdue the disease, or to disarm it of its dangerous tendency to rapid disorganization and death.

It is not to be wondered at, that in a disease so frequently fatal in its event, and so unmanageable by mild and ordinary methods, recourse should have been had to *Mercury*, whose effects upon the animal œconomy, whether salutary or deleterious, are generally very powerful. It certainly has been employed to a considerable extent in yellow fever, but whether advantageously or not, is a matter of some doubt. No inconsiderable authorities may be adduced on each side of the question, and their decision of the point in dispute, is said equally to rest on the basis of experience. The most common operation of this metal, when exhibited internally, is either to produce copious evacuations by stool, or to act upon the salivary glands, so as to excite considerable salivation; and in both cases, benefit has been said to be derived from its exhibition. In those cases of recovery which have followed the employment of mercury, some evident effects of its operation have been commonly manifested, while in cases which have terminated fatally under its use, no perceptible action has arisen from it; whence the recovery in the former case has been attributed to the action thus produced, while the fatal event has been supposed to be owing to the want of such action. Such reasoning, however, there is ground to think is too often fallacious. Supposing that the patients labouring under yellow fever, in

whom a salivation can be excited, generally recover, it is not necessarily to be inferred, that their recovery was effected by the salivation; or that when patients died, to whom mercury had been given, and no salivation had been produced, such patients died, because mercury had not been taken in sufficient quantity to produce that excretion. It is far more reasonable to conclude, Dr. B. thinks, that where persons have recovered from the yellow fever, after having been salivated, their recovery was not occasioned by the salivation, but was the consequence of such a condition of the powers of life, and of the functions connected therewith, as induced a mitigation of the disorder; for the same reason, and, perhaps, in the same degree as it favoured the operation of the mercury upon such persons; and, therefore, that although recovery has not unfrequently followed or accompanied salivation, the latter was not the cause of the former. In like manner, there is reason to conclude, he thinks, that when patients die of yellow fever, after all attempts to excite salivation in them have failed, their deaths have resulted, not from the want of any good effect which salivation may be thought capable of producing, but because the condition of their living or sensorial power, and of the functions depending thereon, had already become so morbid, as to render their recovery impossible. We shall here give the summary of our author's reasoning upon this important subject, the exhibition of mercury.

“In order, however, to attain the truth upon this important subject, it is not sufficient for us to discover, that recovery generally follows salivation in yellow fever, though even this is contradicted by many very respectable authorities; but we must ascertain whether those practitioners who excite salivation in as many of their patients as may be susceptible of it, under that disorder, do in fact lose a smaller proportion of them than those who purposely

abstain from all endeavours to produce that discharge; and on this point, I must declare, that after some experience, assisted by no ordinary portion of inquiry and information, I have not been able to discover that the salivators were more successful than the others. And, if not more successful, their practice has certainly been hurtful; because, in most of the persons who have recovered, the (perhaps useless) salivation had retarded the convalescence, and produced very troublesome affections of the tongue, mouth, and throat, with other ill consequences, as is well known and acknowledged, even by its advocates. Dr. Chisholm, (at page 357, of vol. i. of his Essay,) warmly acknowledges his "obligations to Dr. Rush, for supporting in a masterly manner," and "pursuing the mercurial mode of treatment," and expresses both "admiration and respect" for his "fortitude" in doing so.

But Dr. Rush, notwithstanding this support and this fortitude, has candidly stated, that 'in the City Hospital, (of Philadelphia,) where bleeding was sparingly used, and where the Physicians depended chiefly upon salivation *more than one-half died* of all the patients who were admitted.'

"To one who is sincerely desirous of discovering and adhering to the truth, it is extremely difficult to reconcile, or account for, the very opposite testimonies given on this subject; and the doing it would moreover be too invidious for me to attempt it. This, however, appears certain, that the good effects of the mercurial treatment have been greatly exaggerated by persons, who either were deceived, or were willing to deceive others; that many persons have died of the fever in question, although mercury administered externally or internally, had produced a copious salivary discharge; and that in very many others who have recovered, this discharge did not begin until after a solution, or a great mitigation of the disease had

evidently taken place; which solution or mitigation, therefore, could not have been the effect of salivation.”*

After having thus gone through the account of the symptoms and treatment of the Yellow Fever, we come to a consideration of its causes. A belief has prevailed of the contagious nature of this disease; and the origin of it, in different places, has been ascribed to the action of contagion. Our author strongly controverts this opinion; and while he denies that any instances of the fever have ever been clearly shown to arise from contagion, he enters into an elaborate discussion, to show the impossibility of its doing so. It has been asserted by some authors of eminence, that *all* fevers are naturally contagious, and capable of exciting fever in other persons.† Among those who have so asserted, Dr. George Fordyce is to be found, and he has expressed himself very strongly on this subject; his opinion is, that a peculiar matter is *generated* in the body of a man in fever, which being carried by the atmosphere, and applied to some part of the body of a person in health, causes a fever to take place in him; and he adds, that this infectious matter is produced by *all fevers whatever*. In confirmation of this opinion, he adds, that “by repeated experience it is now known that, although it very frequently happens that a man coming near another afflicted with fever, is not afterwards affected with the disease, yet, of any number of men, one-half of whom go near a person ill of this disease, and the other half do not go near a person so diseased, a greater number of the former will be affected with fe-

* Mr. Sheppard in a very able Paper in the 13th Volume of the Edinburgh Medical and Surgical Journal has adduced the opinions of various modern Practitioners in corroboration of the inutility of attempting to affect the system with Mercury, during the active stage of Yellow Fever.

† Drs. Gleghorn, Robert Hamilton, John Clark, Fordyce, &c.

ver than of the latter, in a short period afterwards." Again, he says "the author has known seven out of nine, who went near a person afflicted with fever, seized with the disease in the space of three weeks afterwards; there is, therefore, a perfect ground from experience, for believing, that coming near a person afflicted with fever is a cause of the disease."

Dr. Bancroft's objections to this opinion of Dr. Fordyce are thus stated. "This general indiscriminating assertion, if it were true, could only prove that some fevers are contagious; not that all are so. But the assertion is manifestly founded upon a supposed probability, or presumption, that such effects would result from the causes here described; for no one can believe, that an actual experiment was ever made by selecting a certain number of persons, and sending one-half of them into close communication with a febrile patient, and afterwards contrasting what happened to those who were not allowed to approach any person labouring under fever. Nor would a single experiment afford any conviction on this subject, for reasons too obvious to require explanation. Much also would depend on the species of fever to which the individuals in question are supposed to have been exposed, which is not mentioned by Dr. Fordyce. Few persons, if any, doubt of the contagious quality of what is called Jail Fever, and few believe that intermittent fevers possess that quality."

Before we go further, I must reply, in answer to these objections, that we can scarcely allow Dr. Fordyce's assertion to be founded upon a *supposed probability or presumption*, when he affirms that by *repeated experience* it is now *known*, &c.; and although we cannot prove that Dr. Fordyce actually made the experiment of selecting a certain number of persons, and sending one-half of them into close communication with a febrile patient, and afterwards contrasting what happened to these with the condition of those

who were not allowed to approach any person labouring under fever; we may be convinced from the well known character of the Doctor, that he would not neglect any *practicable* method of ascertaining the truth of an opinion he was about to publish to the world. Would he not have been warranted in his conclusion, if he had ascertained, that out of a given number (sufficiently large) of patients coming under his care with fever, *more than one-half* had, within a short period, been near persons affected with fever? I do not think the validity of the argument at all depends on the *species* of fever, since it is evident that Dr. Fordyce was not now speaking of fevers propagating themselves by *specific* contagions, but of the *generation* of infectious matter in fevers, which might produce in other persons fever, either similar to themselves or different from them, depending on circumstances peculiar to the persons exposed to its action; and that he did not deny to intermittents the power of thus generating infectious matter we are assured, by his saying that intermittent fevers produce this matter, or in other words, are infectious; and that “he *knows this from his own observation*, as well as that of others.” So far as argument goes, grounded on facts, I think we have another in favour of Dr. Fordyce’s opinion. Do we not sometimes see an individual in a family seized with fever, when no intercourse with other febrile persons could be traced, where indeed it was almost impossible any should have taken place? and do we not see afterwards several members of the same family affected with fever, communicated as far as we can judge by the person first affected? In this case, one of two things must be true; either the action of contagion cannot be so limited in extent, as has been contended, if the first person took the fever from infection; or a matter must have been *generated* in the person first affected capable of producing fever in others. We must choose between the unlimited dif-

fusion of febrile infection, or the generation of it in fevers arising from other causes.

Of *Negative proofs*, I confess, Dr. Bancroft has produced sufficient to show that fever may sometimes exist to a considerable extent, without producing fever in other persons communicating with those originally attacked; some of these proofs I shall lay before my readers, only remarking first, that they are all instances of marsh remittent fever, and that Dr. Fordyce says, intermitting fevers are not nearly so apt to produce contagious matter, at least to propagate it, as continued fevers; and secondly, that most of these instances occurred in climates very different from that of this country, and it is to this country Dr. Fordyce's observations are perhaps chiefly intended to apply.

The first instance mentioned by Dr. Bancroft, is that recorded by Dr. Trotter, in his *Medicina Nautica*, occurring at the Island of St. Thomas's, 1762, where *all* the people who were lodged ashore during night, died afterwards on the passage, while the rest of the ship's company remained remarkably healthy. A similar instance also occurred in the crews of the Ponsborne and Nottingham East Indiamen, at the Comora Islands, in the years 1765 and 1766. Of this fever, Dr. Badenock, then surgeon of the Nottingham, observes, it infected *only those who slept on shore*, and having gone through them the fever ceased; this he says, was also the case with those on board the Ponsborne, of whom, it appears, no less than seventy died. A similar occurrence is related by Dr. John Clark, in the first volume of his *Observations on the Diseases which prevail in Long Voyages to Hot Countries*, page 124; after describing the low place, "covered with impenetrable mangroves, at North Island, near the Streights of Sunda, where most of the East India ships take in wood and water for their homeward voyage;" he adds, that "a

Danish ship, in 1768, anchored at this island, and sent twelve of her people on shore to fill water, where they only remained two nights. *Every one* of them were seized with a fever, of which *none recovered*; but, although the ship went out to sea, *none*, except the twelve who slept on shore, were attacked with the complaint. Here again was a fever so violent as to kill every one in whom it was excited, and from a cause so powerful as to affect every one who was exposed to it; which, notwithstanding, did not reproduce itself in a single instance."

One of the most decisive instances of the non-contagious quality of the marsh remittent fever is, the author thinks, to be found in the late unfortunate Walcheren expedition, wherein nearly thirty thousand men and officers were attacked by fever, which proved fatal to nearly one-sixth of the whole number of sick; and yet not a single case could be discovered in which there was reason to suppose that any one person caught the fever from another, either upon the island of Walcheren, or among the sick removed to this country; so that we may fairly conclude, if fevers of this description are ever contagious, and communicated to those not previously exposed to marsh miasmata, the instances are rare and solitary, and that, in general, they must be ranked as non-contagious; we shall see, hereafter, the author's reasons for classing the yellow fever among the species of marsh remittents, and his proofs of its non-contagious quality.*

Another question, amply discussed by our author, previous to his enumeration of the causes of yellow

* In enumerating the chief writers for, and against contagion, at the commencement of this section, I have omitted Drs. Palloni, Arcjula, Hossack, and several others, because they consider this disease as contagious, or infectious, in some situations, and in others not contagious; and therefore cannot, with propriety, be classed with either party.

fever, is, whether a fever, strictly contagious, can be generated by an accumulation of filth, or of putrefying or putrid matters, or by the crowding of healthy persons into confined, or ill-ventilated, and unclean places? With respect to the first part of the proposition, the generation of contagious fever by the accumulation of putrefying or putrid *dead* animal matter, I believe the general opinion of the medical world is against putrefaction being a source of febrile contagion, and therefore it is unnecessary to repeat the various instances related by the author, of large masses of these matters existing in different places, and no fever having been traced to arise from them; but physicians are not so unanimous in their belief concerning the power of emanations from the healthy *living* body, to generate, when accumulated and concentrated, fever of a contagious nature, and therefore it may be worth while to state some of the arguments and facts adduced by Dr. Bancroft, in favour of the innoxious qualities of human effluvia, so far as regards the production of fever. That crowding, filth, and deficient ventilation, may take place in a variety of situations without producing contagious fever, the author has shown in instancing the mode of life led by the inhabitants of the more northern climates, who are shut up for a long severe winter in courts, or subterraneous dwellings, each common to many families, in which they live in horrible filthiness, among whom fever is not known to arise; the wretched confined situation of the slaves on the middle passage of the slave ships, in a sultry climate, without any production of contagious fever among them; and the memorable occurrence of the confinement of British subjects in the Black Hole, at Calcutta, in June, 1756, where, out of 146 persons shut up a whole night in a dungeon, about a cube of 18 feet, only 23 remained alive in the morning; none of whom were afterwards affected with fever. All these instances, however,

having occurred in climates where the extremes of temperature might be supposed to counteract and destroy the tendency to contagion arising from these circumstances, it becomes of great importance to examine Dr. Bancroft's explanation of the supposed production of contagious fevers from similar circumstances in this country.

The first memorable instance of mortality from the apparent effects of morbid contagion noticed by our author, is that occurring at the Black Assize, at Oxford, in the month of July, 1577. The circumstances of this event are well known, and the opinion has been generally prevalent, that the disease was communicated by infection. The author, at great length, and with much ingenuity, endeavours to controvert this opinion; I must refer our readers to the work itself for the arguments he makes use of for this purpose, and content myself with giving the conclusion he draws as the result of his investigation.

“The most probable *meaning* of all these accounts would seem to be, that, about the time when sentence was passed on the prisoners, a noxious vapour, in some degree perceptible to the senses, and proceeding either from the prisoners or the earth,* had been

* Camden makes use of the words *venenoso et pestilenti halitu sive fœdore incarcerationum, sive ex solo ita correpti sunt plerique omnes qui aderant*, &c. and Sir Richard Baker says, “suddenly they were surprised with a pestilential savour; whether arising from the noisome smell of the prisoners, or from the *damp ground*, is uncertain.” Dr. Bancroft in a note, observes, “the expressions seem to point at marsh effluvia, which, at that season of the year, would be more likely to occasion disease than typhus contagion, and in a shorter space of time, and chiefly upon vigorous men; probably, also, the situation of the place was suitable for their production. The old Shire Hall, in which sentence was passed on Rowland Jencks, was placed in the *yard* of Oxford Castle, (once deemed impregnable,) which stood on the west side of the town, at a small distance from the river *Isis*, whose banks, especially at that time, were low. The prison was also within the

suddenly diffused through the hall, and that, in consequence thereof, a great part of those who were present had been almost immediately attacked, and that many died within a few hours.

“There is, however, no cause of disease with which I am acquainted, whose effects would have been such as are here described. Pestilential contagion cannot be suspected, because that would have required *contact*, and because the symptoms of the disease were not like those of the plague, nor was it contagious. And there is as little reason to suspect the contagion of typhus, or jail fever, (especially at that season of the year,) there being no instance recorded, or known, of its producing disease so suddenly, nor of that disease, when produced, terminating so speedily in death. Nor were the symptoms such as occur in jail fevers: nor does the contagion of that fever spare women, children, and *poor people*, as the cause of this disease is stated to have done, (but on the contrary :) nor do the stoutest and most robust sooner perish by it, as the Register of Merton College declares to have happened in this disease. (*‘Et ut quisque fortissimus, ita citissime moritur.’*)

Castle, at about 200 yards distance from the Hall, and consisted of a multangular tower, called St. George’s, (on the west side of the Castle,) together with an adjoining church, which also bore the name of St. George, and two square rooms, all connected one with the other, and made the common jail for the county, by a statute in the reign of Henry the Third. See Grose’s *Antiquities of England*, vol. iv. p. 182-3; also, King’s *Vestiges of Oxford Castle*, p. 28. In the Appendix to Thomas Hearne’s *Preface to Gulielmi Neubrigensis Historia*, &c. p. 88, is a print representing the Castle of Oxford, and on the other side of the river is a mount, at the foot of which are the ruins of an old building, which are thus described in a note to the plate, viz. *Reliquiæ domûs in quâ assizæ olim tenebantur, donec ob pestem subitanæam ad alium civitatis locum regnante Elizabethâ transferre placuit.*” But though I think marsh miasmata a more probable cause of the disease in question than typhus contagion, I am far from believing that they would have produced effects, such as are said to have occurred at this Black Assize.”

“Whether the facts connected with the production, and nature of this disease have been misrepresented, or, whether it proceeded from a cause which has ceased to operate in later times, I leave for the decision of others.”

Passing over the accounts of sickness and mortality occurring at Exeter, in 1586; at Taunton, in 1730; and at Launceston, in 1742, since Dr. Bancroft does not seem to deny there being instances of jail infection, we come to the remarkable occurrence which took place at London in May, 1750, at the Sessions of the Old Bailey, which proved fatal to the Lord Mayor and two of the Judges, with several eminent and other persons. These were supposed to have been infected by the contagion of jail fever, brought into the court from Newgate. Such was the opinion of Sir John Pringle, Dr. Hales, and other eminent men. Our author, however, is of a far different opinion; and having given in the Appendix a copious statement of the whole transaction, and pointed out an important fact, acknowledged by those who have recorded the occurrence, viz. the *opening of a large window* in front, and on the *left hand* of the court, proves that the mischief done, or sickness produced, was confined to* those who were placed in the direction of this stream of *cold air*, which, *therefore, contained and conveyed the morbid influence, whatever it was, that occasioned the fever*; and endeavours to show that this stream of air did not direct the *putrid streams* to that part of the court where the Judges were seated, as asserted by Sir John Pringle; but that the disease which took place in the different individuals, was in consequence of the *morbid affection from the application of cold*. Whatever objection may be urged against the opinion of this fever being pro-

* Dr. Bancroft has given an engraved plan of the Old Bailey, describing the precise situation of the Judges, Jurors, &c.

duced by cold, on account of the *great mortality* which took place, will apply, the author thinks, with equal force, against its having been produced by contagion, since the most concentrated and virulent jail infection ever known in this country, has never produced a fourth part so many deaths among an equal number of sick; and he adds, "though the mortality in question was greater than I should have expected from a fever produced by the sudden application of cold, yet, so many things are capable of increasing and aggravating the morbid effects of that cause, particularly by inducing local and mortal inflammation in some important organ, or viscus, that it is much less surprising that a fever so produced should occasion an unprecedented mortality, than it would have been, if so many deaths had resulted from a jail or typhus fever." See Appendix No. iv. p. 653.

I have been thus full in stating our author's view of the question respecting the generation of contagion, because it is one of serious importance, and one on which much uncertainty still prevails. Little doubt has been entertained by many men of respectable talents and extensive observation, of the generation of contagion in close and ill-ventilated apartments; I shall instance two only, the late Dr. Murray, of London, who took so active a part in the establishment of a fever-house of recovery in the metropolis, and Dr. Ferriar, who directed his attention to a similar establishment in Manchester, because they may be supposed to have inquired into the subject with the greatest care. The latter says, "It is a fact, equally alarming and true, that many persons in indigent circumstances are exposed in our great towns, to such evils as I have shown to be *productive* of febrile contagion."

"One of the most satisfactory instances of this sort was observed by Dr. Heysham, at Carlisle, in 1778 or 1779. A fever of the nervous kind raged in

that city, which did not seem to have been introduced from any neighbouring place. Dr. Heysham, with great industry, traced its *origin* to a house near one of the gates, which was tenanted by five or six very poor families; these unhappy creatures had blocked up every avenue of light with which even wretchedness could dispense, and thus contaminated the air of their cells to such a degree, as to *produce* the poison of fever among them." "The plague itself appears to *originate* with the crowded inhabitants of the miserable villages in the East."*

No doubt, however, can exist of the propagation of the febrile infection being facilitated by want of cleanliness and ventilation; and this knowledge will be a sufficient inducement to obviate this source of its diffusion when practicable.

The most frequent, or rather, according to our author, the only exciting cause of yellow fever, is the application of marsh miasmata to the human body, and the disease, therefore, is really a marsh remittent fever. The opinion held by some eminent men, that fevers of this description might be produced by simple moisture alone, is, I think, successfully controverted by Dr. Bancroft; and he accordingly looks for the specific cause of the fever arising into the air in something from the decomposition of animal or vegetable matters. Sufficient has been stated in the former part of the volume to show that the most extensive decomposition of animal matters may be going on, without any disease taking place in those exposed to the exhalations therefrom; it follows then, that the noxious particles, whatever they be in marsh exhalations, arise from the decomposition of vegetable substances; and this opinion is strengthened by the fact, that fevers are sometimes produced in persons employed in the preparation of flax and hemp,

* Ferriar, Vol. 1. pp. 240 and 245.

and in those who continue near the heaps of indigo plant, laid together after the colouring matter is extracted. Whether any one particular gas, known to be produced by vegetable decomposition, or a combination of several of these gasses, or some matter not yet detected, is the efficient cause of the disease, can, in the present state of science, be no more than matter of conjecture. We know, however, that the *action* of this cause is facilitated and increased by the concurrence of certain circumstances, and that its operation is more powerful in hot climates and hot seasons, than in the contrary ; but our author points out a difference of *susceptibility* in persons exposed to marsh miasmata, which renders their influence on the system more or less powerful ; his observations on this subject are so important, that I cannot refrain from laying them before my readers.

“ There is, however, *another condition of the body*, which is of great importance, in regard to the production of yellow fever, and which, therefore, requires a particular investigation ; I mean, the *cause* of that remarkable *susceptibility* to this *disease*, which is commonly found in persons who have just arrived at places where it occurs, from cold or temperate climates ; and of the equally remarkable exemption from it, which is commonly experienced by the *old* inhabitants of hot countries ; and which, in the latter, is universally ascribed to their having become seasoned, as it is called ; but, however familiar this term may be, and of whatever importance its proper signification really is, (since it involves the means of preservation from one of the most dreadful maladies which afflict the human race,) it has been long employed either without any precise meaning, or with meanings which are inadmissible. Thus it is often said, that a person is seasoned who has once had the yellow fever ; but very improperly, because the same individual may have the disorder several times ; besides

which, many persons become exempt from the fever, and ought, therefore, to be considered as being truly seasoned, without having ever suffered an attack of the disease. It is also frequently believed, that one may become seasoned by residing long in those towns in which the yellow fever is apt to recur; but the very great numbers of the inhabitants of Philadelphia, New York, Malaga, Cadiz, Seville, &c. who have been swept off by the distemper, within a few years, are melancholy proofs that an efficacious seasoning is not to be acquired merely by such residence. Nor can it be said, that those who live near marshes are peculiarly seasoned, because, in hot countries, numbers of persons, who live at a distance from marshes, are proof against the yellow fever, although they are sometimes attacked with slight remittents or intermittents.

“After some reflection on this interesting subject, the various degrees of susceptibility which are observed in different individuals or in different places, seem to me capable of explanation on a very simple principle; I mean the effects of temperature on the human frame, which does not appear to have been sufficiently noticed.

“The body, whilst in health, is found always to be, with very slight variation, at the temperature of 98 degrees of Fahrenheit’s thermometer, and there is good reason to think that any considerable variation from this point, would necessarily produce morbid effects. It seems, therefore, to be of high importance, that the body should be preserved from such deviations; and the Author of Nature has, accordingly, provided efficacious means for that end. Different opinions are indeed entertained concerning these means; and, since the later chemical discoveries have been made, it has been generally believed, that, in an atmosphere, the temperature of which is less than 98 degrees, the heat of the human body is maintained at that

point, by a process similar to that of combustion, and depending upon a combination of oxygen gas, (taken into the lungs by respiration,) with carbon and hydrogen; and that, in an atmosphere heated above 98 degrees, the temperature of the body is kept down at that point by the effect of an evaporation of matters perspired from the skin. There are, however, insurmountable difficulties opposed to this doctrine, but a full statement of them would, in some degree, be foreign to the subject under our consideration; I will, therefore, at present, only remark, that it is *utterly incredible* that these *opposite processes* should ever be carried on so *accurately in reference to each other*, and be so *exactly balanced*, as invariably to keep the body at the heat of 98 degrees, in all the diversities of temperature that occur in different climates and situations, and therefore, that this important *conservatory* function must depend on a power more *exalted* in its nature, and more *certain* in its operations, which can be no other than the *power of life*; a power which, in proportion as it is more vigorous in robust individuals at the prime of life, notoriously enables them to resist the *opposite extremes* of heat and cold, and preserve their bodies at the proper standard more perfectly, and for a greater length of time, than at a more advanced age. I will not venture to assert that no addition to the heat of the body can be made, either directly or indirectly, by the combination of oxygen with the blood, and I readily admit that its temperature may be diminished by a copious evaporation from its surface; but if either of these causes should co-operate with the living power to a small extent, the one in raising and the other in lowering what is called animal heat, it must always be in complete *subordination* to the higher principle of which I have been speaking, and to which nature has committed the important charge of preserving the temperature of the body at the

standard of health, amidst all the varieties of climate, and of external circumstances. This is a charge which cannot be fulfilled in an atmosphere like that of England, the mean temperature of which may be estimated at 50° , without a considerable expenditure of the living power, in order to generate constantly at the mean rate of 48° of animal heat; and after the body has been, for a length of time, accustomed to make this exertion, it is easy to perceive that, upon removing into a warm climate, such as that of the West Indies, the general mean temperature of which may be taken at 79° or 80° , very material changes in the functions of the system become absolutely necessary for the preservation of health.—But these changes are not to be suddenly effected; and, until the body becomes perfectly accommodated to the heat of this new climate, the whole animal economy must be considered as almost in a state of morbid excitement. It is not this state, (of excitement,) however, which alone is productive of fever; since we know that innumerable persons have gone from Europe to the hottest regions of the globe, and have continued there for years, without being attacked by fever, when other causes did not assist in producing that disease. The inhabitants of South Carolina, as I have lately mentioned, were exposed to this kind of excitement, in an extreme degree, during a great part of the summer of 1752, and yet had never been more healthy; and other instances of the same import might, if necessary, be adduced.”

“ But, although the simple operation of the warmth of hot climates upon the human body be not the cause of this disease, yet it is chiefly, if not entirely, to the various degrees of that derangement which it occasions in persons not accustomed to warm climates, that I attribute all those varieties of liability to the epidemic yellow fever, which are observable in differ-

ent individuals, from the extreme susceptibility of northern strangers to the almost complete immunity of Creoles, and more especially of African negroes. It may be very difficult to point out the particular means by which heat occasions this extreme susceptibility; and yet it is not difficult to understand, that a morbid cause may be able to produce a much more violent disease, when it is assisted by the co-operation of so powerful an agent as heat, than it could produce when acting by its own single influence; and it is upon this principle that I shall endeavour to explain the general law, by which the susceptibility to the yellow fever is *cæteris paribus*, regulated," p. 254.

The author then takes a concise view of the climates in which the yellow fever has principally raged, and applies the principle just mentioned, to the results which the experience of several years in each of them has afforded. It appears, that negroes are far less liable to be affected with yellow fever than white persons; and it was observed at Cadiz in 1800, that persons lately arrived in that city from the West Indies, did not suffer an attack of the epidemic, while those persons who had come from *Canada* and other *northern* countries, were very liable to the disease. The security from the attacks of this fever derived from the "*ability to endure great heat*," continues only so long as this ability continues; for if the inhabitants of warm climates remove for a few years into cold countries, and afterwards return, they are then found liable to the fever. From all the facts stated, and from the repeated observations made by the author, he thinks himself justified in his opinion, that the joint influence of marsh miasmata, and of an atmosphere unusually and sufficiently heated, upon persons habituated to a cold or temperate climate, is of itself, fully capable of causing an epidemic yellow fever, exactly resembling that which has committed

such ravages in the West Indies, the United States of America, and the South of Europe.

Upon the preceding theory, that those varieties of liability to the epidemic yellow fever which are observable in different individuals are to be attributed “chiefly, if not entirely, to the various degrees of that derangement which heat occasions in persons not accustomed to warm climates,” it may be necessary to offer some observations; for there is reason to fear that this view of the subject is much too limited. The ability to endure great heat is undoubtedly a considerable, but it is not the only, or perhaps even the chief source of immunity; otherwise those who have been inured to other tropical regions, where the temperature is as high, or higher than it is in the West Indies, would be protected from the yellow fever, which is far from being the case. The leading features of Dr. Bancroft’s writings are, great industry in research, and acuteness in argument. Admiring these talents, it is not from a disposition to criticise, but from the momentous importance of this part of the subject, that I am induced to reconsider his discussion of the question—in what does this seasoning consist? He contends, that it is not from having previously undergone the fever, because the same individual may have it several times; and because many persons become exempt without ever having suffered an attack of it. To this it may be answered—it is true that a person is not secured by having had the fever once, as some writers of limited experience have discovered, but it is also true that he will be less liable after having sustained an attack of this, or any disease which reduces the tone and vigour of the system; and that those who escape altogether do not acquire their security by mere length of residence, and consequent habituation to the predisponent, tropical heat, but also because they have been *gradually* exposed, and inured to the other

remote causes of the disease.* Again, Dr. B. observes, it is not from residing long in *any* place in which the yellow fever is apt to occur, as the multitudes who were swept off at Philadelphia, New York, Malaga, Cadiz, &c. abundantly demonstrate; but these are places in the temperate zone, whose variations of climate must ever prevent the inhabitants from acquiring unsusceptibility, as will appear more clearly hereafter; and if seasoning cannot be induced by intertropical residence alone, with how much less reason, *a fortiori* can such effect be expected from the ultra-tropical situations above specified. The last argument of Dr. Bancroft is—that it is not from residing habitually near marshes, because numbers of persons who live at a distance from marshes in hot climates are proof against the yellow fever, although they are sometimes attacked with slight remittents or intermittents, (p. 246.) Now, in the first place, the living at a distance from marshes proves little or nothing, because the whole bearing of Dr. B.'s researches is to show that febrific exhalations “are often emitted from soils and situations which have no resemblance to a marsh,” (Sequel, p. 254;) and secondly, as these people do suffer attacks of the milder recurrent type, they certainly would be liable, at particular seasons, to the more aggravated form of fever, if they had recently arrived, instead of having been gradually inured to these miasms; or if, though favoured by longer residence, they were exposed to more concentrated miasmata. Upon the whole, then, it is not upon any simple principle—as the being accustomed to great heat, that we can explain the grounds of exemption from yellow fever.

If this disease were simply a calenture as Moseley and some later writers seem to consider it, then in-

* Mr. Sheppard has further illustrated this subject in a paper inserted in the 47th No. of the Edinburgh Medical and Surgical Journal.

deed we need look for no further source of exemption than the power of resisting the effects of high temperature; but as the novelty and consequently the force of the impression of insolation must be greatly diminished by habit, and as notwithstanding individuals have too frequently fallen victims to yellow fever who have been exposed for years together to a tropical heat, when brought fully under the operation of noxious causes, the conclusion is inevitable, that habituation to the local febrific effluvia, be they from the soil or other source,—and to other agency, beyond that of solar heat, is indispensable to security. In proof of this, medical men who have resided for a length of time in the Antilles, have repeatedly observed individuals fall victims to the yellow fever, after having been two, three, four or more years in that country; evincing that the being inured to a high temperature is but one disqualifying property, and of itself unable to confer immunity, (though I am far from questioning its relative importance in greatly contributing to this result,) when other powerful exciting causes are applied.

The Fourth Part of this Essay contains a history of the yellow fever in the various places in which it has often prevailed as an epidemic; the intervals of its appearing epidemically are sometimes considerable, while at other times the fever rages more frequently. In no instance, however, can its origin be traced to contagion, but it seems always to have been produced by local causes, aided by the increased temperature of the season. Our author therefore next endeavours to establish the *identity* or *near affinity* and *connexion* of the yellow fever with the fevers which are indisputably and notoriously produced by marsh miasmata. These latter have certain *characteristic peculiarities*, which are pointed out by the author, and afterwards compared with those phenomena which accompany the yellow fever, to show the

very great similarity and near resemblance between the two diseases.—These characteristic peculiarities of marsh fevers, as stated by Dr. Bancroft, are, 1st. That of occurring in their simple and mild form of intermittents during the spring. 2nd. That of being exasperated, converted to *remittent*, and apparently to *continued* fevers, by excessive summer heat; and this, generally, with a great increase of malignity, (especially in low and moist situations,) when this excessive heat is long continued, and accompanied with a *total, or very unusual, deprivation of rain*. 3d. That of their being re-converted and brought back to their mild intermittent form, at the approach or commencement of winter, and afterwards extinguished, or suspended, by a continued frost. 4th. That of most frequently and violently attacking strangers from colder climates and more salubrious situations. And, 5th. That of never being communicated from person to person by a contagious property.

In addition to the facts and authorities already mentioned in the former part of the volume, as tending to prove these peculiarities in marsh remittent fevers, the author brings a great number of additional proofs to the same point, and afterwards shows the existence of similar phenomena in the yellow fever, in his account of the history of its origin and progress in almost all the West India Islands, and at several places in North America. To follow Dr. Bancroft through the whole of this diffuse statement is impracticable, but I shall subjoin his inferences on the subject of the identity of the two diseases, which naturally arise from the history and statement he had previously given.

“Those of my readers who, by a love of truth, may have been induced to follow me attentively in the *view* which I have now taken of the yellow fever in different parts of America, and whose minds are

unbiassed, will, I am confident, clearly recognize in that disease, *all the peculiar features and characteristic marks* by which *marsh fevers* are distinguished in all parts of the world. And they will naturally conclude, that though it be the most aggravated and virulent of the fevers arising from miasmata, this aggravation and violence are produced only by a greater concentration or virulence in the latter, joined to a greater intensity of atmospherical heat, acting on persons but little accustomed to bear it, whilst they retain the excitability of cold or temperate climates, together with an habitual disposition to generate that portion of animal heat which such climates require. They will have seen that the yellow, like other marsh fevers, is always exasperated by great heat, and extinguished or mitigated by cold; that between the tropics it prevails *simultaneously* with the milder forms of marsh fevers, violently attacking *strangers* from cold climates, whilst the natives or long residents are at most only subject to intermittents or mild remittents. They will have also seen, that in temperate situations this disease, in the early part of summer, before the atmosphere has become intensely hot, is commonly preceded by, or *rather shows itself in*, the forms of intermitting or remittent fever; and that when being exasperated by excess of heat, it has assumed, and for some time prevailed under, the appearance of an epidemic yellow fever, the accession of cool weather speedily reduces it again to its milder forms, and that a freezing temperature soon puts an end to its appearance, even in those forms, as it commonly does to other fevers occasioned by exhalations from marshes, *and to no others*. And they will also have seen, that the common bilious remittent of hot climates, which is universally admitted to be the effect of miasmata, differs from the yellow fever only by being a little less violent; that, at the utmost, their symptoms vary only *in degree*; and that, in truth, even this difference

is often so imperceptible, that the College of Physicians in Philadelphia, when anxious to assign a distinction between the *yellow* and the *bilious remittent* fevers, thought it necessary to allege *one*, which is not only *invisible*, but without *existence*, i. e. contagion. In fact, there is no difference between these fevers, excepting the greater violence, and consequently, greater danger attending the former than the latter; for the yellow colour appears in both: and supposing the fatal *black vomit*, with profuse hæmorrhages and petechiæ, to occur only in what is called *yellow fever*, (though they are sometimes seen in fevers known and admitted to arise solely from marsh effluvia,) they cannot be included among its essential or distinguishing symptoms, unless *death* be also considered as essential to the disease. Nor can any exasperation of symptoms, which has been preceded by a great degree of heat, give any reason to suspect that a fever, whose symptoms are thus exasperated, did not originate from miasmata, because such an exasperation is invariably produced by that *cause* in marsh fevers; and by it they are susceptible of the most dangerous and malignant appearances.

“With so many proofs of identity in their cause, and of the nearest affinity in their symptoms and reciprocal conversions into each other, as well as in their effects on the human body, and their changes by heat and cold, &c. it would be highly unreasonable not to consider them as being only *varieties of one disease*. And I think with Dr. Rush, that we might as well ‘distinguish the rain which falls in *gentle showers* in Great Britain, from that which is *poured in torrents from the clouds in the West Indies*, by different names and qualities, as impose *specific names and characters* upon the different *states* of bilious, (or marsh,) fever.”*

* That the fatal Endemic of the West Indies is the highest grade, or most aggravated form of Tropical Fever, is now, with some exceptions, the general conclusion of the best informed practitioners. Besides many authorities, incidentally cited on this point,

The Fifth Part commences with a Chapter on Typhus or Contagious Fever ; a term vaguely applied at present to designate generally all low or slow fevers arising from great fatigue, cold and damp habitations, unwholesome or insufficient food, anxiety, grief, fear, and other depressing passions and debilitating causes, having no connection with contagion, nor any power of producing a contagious disease, but which should, the author thinks, be restricted to a fever *sui generis*, strictly contagious, and derived exclusively from its own specific cause, or contagion. I have before stated Dr. Bancroft's opinions on the

in the course of this discussion, it is also the opinion of the following able Physicians, whose opportunities of witnessing Fever in various Climates, have, from their official situations, been very extensive, viz.—Drs. Pinckard, Cole, Gray, Muttlebury, Denmark, Veitch, Mortimer, Macmullin, Vance, Forbes, &c. See Bancroft's Sequel, and also a very good Paper by Dr. Musgrave, Medical and Chirurgical Transactions, Vol. ix.

Some highly respectable observers are also of opinion, that the modifications impressed on the endemic febrile cause by the influence of locality and of season, are manifested not only by variety of type, but also by the production of the dysenteric and ulcerative forms of fever. Dr. Jackson remarks, "In the interior of most of the Islands, at an elevation of five or six hundred feet above the level of the sea, among a series of mountainous ridges, not exposed directly to currents of exhalation from swampy and low grounds, the form of disease is sometimes intermittent, sometimes remittent, or continued, but more generally dysenteric, for the most part slight and manageable, sometimes violent and dangerous. The eruptive and ulcerative, or sore leg belongs also to the elevated situation, especially in the dry season." Sketch of febrile diseases, p. 8.—On the conversions of the febrile cause, Dr. Lempriere thus expresses himself—"In low flat situations, where during the rainy season the water did not readily pass off, I found active continued and remittent fevers, and obstinate and fatal intermittents to prevail. In the vicinity of Lagoons, where water was always present, dysentery and common intermittents were observable. In the first elevation of mountains, mild intermittents, in the second elevation obstinate ulcers, and in the third and still higher elevation neither fevers, dysenteries, nor ulcers were common."—On the difference of situation and elevation, as favouring a tendency to fevers, dysentery, or ulcer, Dr. Porter, who served in the West Indies at the same period, holds an opinion very similar to that of Dr. Lempriere.

origin and propagation of febrile contagion, and pointed out wherein he differs from the generally received notions on this subject. The difficulty of determining whether any individual case of typhus has originated from some of the causes which have usually been considered adequate to its production, or whether common low fever may have degenerated into typhus, as has been sometimes supposed, must be very great, if, as the author is inclined to believe, an interval of five or six months may sometimes elapse before the actual production of fever by typhus contagion received into the system, especially if the summer should intervene previous to an attack; in which case the occurrence of fever would, the author thinks, almost always be postponed until the following winter. Under such circumstances, I do not see how the question is to be determined satisfactorily, since it is nearly impossible to demonstrate that any person has not been unconsciously exposed to typhus contagion many months before, whilst his fever has apparently been produced by fatigue, cold, &c.

The history of contagious fever is involved in great obscurity; nor is it until lately that it has been observed and distinguished with any tolerable accuracy. Typhus differs in almost every particular from yellow fever; it is properly a disease of cold climates: the heat which is favourable to yellow fever, soon puts an end to the typhus contagion; whilst the cold seasons and climates, which stop the ravages of yellow fever, are the most prolific in fevers of contagion. The susceptibility to typhus is also in direct opposition to that for the yellow fever. We have seen that persons going from cooler into hot climates, are more obnoxious to the yellow fever than the natives or long residents in those climates; whereas, "those who by birth and residence have been long habituated to intertropical climates, are, when they remove into the cold, particularly susceptible of the action of typhus

contagion, if exposed to it. The accession and progress of the symptoms also are very different in the two diseases; typhus is generally accompanied with less mortality, and the derangement which it occasions in the system is much less permanent and mischievous, than that which accompanies or results from even the remittent fever of Europe." As a proof of this, the author compares the events produced by typhus in the British army, subsequently to the return of the troops from Corunna in 1809, with those which attended or followed the expedition to Zealand in the same year, when our soldiers had been exposed to the causes producing the remittent fever. It appears, that in the former instance the deaths did not exceed one in ten of the sick, notwithstanding some disadvantages of accommodation and treatment under which they laboured; whereas, on the Zealand expedition, the deaths were but a small fraction less than one in eight, although no such disadvantages existed; and "the recoveries much more tedious, relapses perhaps one hundred times more frequent, and very often followed by permanent obstructions or morbid alterations of the viscera, ending in dropsy, or other chronic affections."

Dr. Bancroft having been employed with the troops from Spain, labouring under typhus, availed himself of the opportunity of ascertaining the time which the contagion may remain latent after its application to the human body. For this purpose he procured returns of the orderlies and nurses who had attended the sick in question, and had been afterwards attacked with the same fever; and also an account of the time when the attendance of each began, and of the interval which succeeded previous to the attack. The sum of his observations is thus stated.

"It results, therefore, from this statement, that among the ninety-nine orderlies and nurses, who had probably *not* been exposed to the contagion before

their attendance on the sick commenced, the *earliest* attack was on the 13th day, and the *latest* on the 68th ; but these returns were made up about the 20th of April, and it appears that some who had escaped till that time, were afterwards attacked."

The second Chapter contains observations on Dysentery, wherein the author contends against this being a disease of contagion, except when it exists together with typhus fever, (a connection, however, he seems much inclined to doubt ever taking place ;) but he asserts, that for the most part it is produced by the same causes which give rise to remittent fever, viz. heat and marsh miasmata. The circumstances which determine the morbid influence of marsh effluvia towards the intestines, so as to excite the disease in question, rather than intermitting or remitting fevers, do not, he thinks, seem to be yet well understood. Various facts are stated by Dr. Bancroft, proving the non-contagious property of dysentery, and showing that it is frequently epidemic at the same periods and in the same places with marsh remittent fever, and the probability of their acknowledging the same causes is increased by the alternate *succession* of one disease to another, which so often takes place. The author's treatment of the disease is accordingly founded upon this view of its nature and cause ; and as his directions on this head are comprised in few words, I shall here give them.

"As in this disease there is manifestly a morbid determination of febrile or inflammatory action upon the intestines, I think, and have always found it beneficial, speedily to counteract this disposition, and produce an opposite determination, so far at least as to create a salutary distribution of the blood, and of the living power, throughout the body, and especially upon its surface, by suitable diaphoretics, combined with opium, in small doses ; by the application of flannels immediately to the skin, and more especially

round the abdomen ; and in urgent cases by the warm bath, (continued for the space of an hour, if the patient can bear it so long,) warm fomentations, and especially blisters upon the belly, taking care at the same time to promote sufficient evacuations by stool, to relieve the intestines as much as possible from all irritation and uneasiness, which they might suffer by a retention of hardened fæces or scybala, and other matters. For this last purpose the neutral purging salts with manna are proper, or a mixture of the oleum Ricini, with the juice of a ripe orange, and a little mucilage of gum arabic, which will agree better with most stomachs, and prove equally efficacious ; emollient purgative clysters may also be employed. Should the disease be attended with considerable fever, care must be taken not to increase it by too frequent use of diaphoretics and opium. When the disease by long protraction, has occasioned ulcerations of the intestines, and more especially when it is complicated with an affection of the liver, calomel should be preferred as a purgative, and it should also be employed with opium, so as to excite a soreness of the mouth." In addition to this, the food should be light and easy of digestion ; when the patient has any particular craving, it may almost always, the author says, be safely indulged. The last Chapter is on the Plague.

Here I shall conclude the present section, and introduce an able analysis of Dr. Bancroft's subsequent Work, entitled " A Sequel to an Essay on Yellow Fever," drawn up for the *Medico-Chirurgical Journal* for Feb. 1818, by my esteemed friend Mr. Sheppard, of Witney, a gentleman of much experience and of sound judgment. It stands in the plural number as originally written.

A Sequel to an Essay on the Yellow Fever, principally intended to prove, by incontestible facts, and important documents, that the Fever, called Bulam, or Pestilential, has no Existence as a distinct, or a contagious Disease. By EDWARD NATHANIEL BANCROFT, M. D. Fellow of the Royal College of Physicians, Physician to the Army, and late Physician to St. George's Hospital. London, 1817. 8 vo. pp. 487. [*Medico-Chirurgical Journal.*]

Sec. II.—The Medical History of our West India possessions presents a melancholy detail of a vast destruction of human life from the ravages of the disease which forms the subject of the volume before us; and the painful feelings which the retrospect is calculated to produce, are certainly not lessened by the reflection, that the state of active and protracted warfare in which we have been involved, has, in addition to the other miseries which have flowed from that source, principally contributed to swell the catalogue of victims to this scourge;—that many thousands of our brave countrymen have escaped the fury of battle, and all the varied dangers “*per mare, per saxa, per ignes,*” incidental to the life of the soldier and sailor, only to fall an inglorious sacrifice to this insatiate foe! Nor have its visitations been limited to the transatlantic shores alone; the inhabitants of many of the southern parts of Europe have, on various occasions, felt severely the pressure of affliction and mortality from this widely extended cause. While in common with every feeling mind, we regret the discrepancy of opinion respecting its origin and nature, which has prevailed among the only legitimate judges of the question, and condemn the asperity and intemperateness in which the contending parties have too frequently indulged, we cannot but rejoice in the prospect which now opens on us, of the discussion being at length brought to a speedy termination:

The overwhelming mass of evidence which Dr. Bancroft has now brought forward, in disproof of the existence of contagion in yellow fever, will, we confidently anticipate, put to flight a chimera, which has in too many instances seduced the attention from the true sources of the disease. The periodical publications, it is true, have lately teemed with refutations of the doctrine of contagion; but in the fleeting and insulated form of those communications, much of their weight and authority is necessarily lost. We therefore hail with real satisfaction the appearance of a work containing an invaluable store of original and highly respectable documents, collected and arranged with no ordinary research and ability, and supported by argumentative talents of the first order. Since the appearance of the Author's former volume, two publications have issued from the press in support of the distinct nature and contagious quality of the "Bulam," or yellow fever; and by one of the writers a claim has been preferred to the discovery of the alleged peculiarity of its attacking the human frame only *once*. With the view of effecting the subversion of these doctrines, Dr. Bancroft has again entered the Arena; and on all the principal bearings of the question, we conceive that his triumph is complete. The quantity of matter accumulated in the present volume, almost defies an adequate analysis; but as from the analogy of our opinions on the subject with those of the author, we find very little to oppugn, or to criticize, we shall endeavour to lay before our readers a condensed view of the most important topics under discussion.

We are informed in the Introduction, that the Lords of the Privy Council deemed the opinions of Dr. Pym of sufficient importance to induce them to make application to the College of Physicians for information on the two chief points which he has endeavoured to establish;—the contagious nature of

yellow fever, and the peculiarity of its attacking only once. The reply of the College, although on the whole favourable to Dr. Pym's pretensions, was undecided, as they properly alleged, for want of experience in the disease. Application was then made by the Council to the Army and Naval Medical Boards. Concerning the communication from the former Board, Dr. Bancroft has not been authorized to give any information. The latter, having collected the opinions of those naval medical officers whose experience enabled them to adduce facts and observations in support, or in refutation of Dr. Pym's propositions, transmitted a concise analysis thereof to the Lords of the Council, together with the original Reports. To these their Lordships have been pleased to allow Dr. Bancroft free access, and from that source a large portion of the evidence contained in this volume is derived.

The author begins his Inquiry by controverting the diagnostics by which Dr. Pym distinguishes his Bulam from the bilious continued, and bilious remittent Fevers; and we are of opinion, that he has undeniably proved that no *specific* difference exists between these forms of fever; that the points on which Dr. Pym has attempted to found a diagnosis, are merely differences of degree, and, that, (excepting the last, the black vomit,) they are not peculiar, uniform, nor essential to the fever in question. Indeed, it appears to us, that they obtain more or less in most dangerous fevers, as, we conceive, must be evident not only to all personally and extensively conversant with yellow fever, but even with fever in general: and, further, that Dr. Pym has himself proved the futility, and destroyed the foundation of such diagnosis, (if we were to grant his assumption, of which, however, an *ipse dixit* is the substitute for proof,) by asserting, that even Dr. Rush himself mistook the bilious remittent for the Bulam Fever.—*Pym's Obs.* p. 209.

Of these alleged diagnostics, the two first, the ap-

pearance of the eyes, and the nature and seat of the head-ache, the author satisfactorily shows from various authorities, to be vague and indeterminate, and, therefore, perfectly useless in diagnosis. With regard to the absence of remissions, constituting the third diagnostic of the Bulam, Dr. Bancroft adduces a mass of evidence to prove “the simultaneous appearance of both forms of the fever, and their reciprocal *conversions* into each other at particular places and seasons; together with the invariable appearance of remittents at the same places, both *before* the high atmospheric temperature has operated sufficiently to give them the continued form, and also *after* the effects of this high temperature have ceased to exist.” Further, Dr. Pym has derived the epidemics of Gibraltar by importation from those of Cadiz, Malaga, and Carthage, and has thereby identified them with the fevers of those places; and Sir James Fellowes states, that Arejula, Gonzales, and Flores are “the three most eminent physicians in Cadiz, and he believes in Spain.” Now, unfortunately for this principal diagnostic, all those writers distinctly mention remissions in their descriptions of the Spanish epidemics; and as regards the fever in Gibraltar, remissions are proved by evidence of seven medical officers of that garrison in the epidemic of 1814. The fourth, or the infrequency and paleness of the yellow colour of the skin, cannot be viewed otherwise than a relative expression; and it will be sufficient to state, that, from the accounts of Sir James Fellowes, Sir Joseph Gilpin, Mr. Donnet, and others, the suffusion of the skin is observed in every intermediate shade between a lively yellowness, and a dingy, or dark hue. The author also rejects the fifth diagnostic, the duration of the disease, on the principle of the want of uniformity. Dr. Pym says, it runs its course in from one to five days; it is admitted, that it commonly does so in its most aggravated form; but it is proved from Arejula, Sir James

Fellowes, Dr. Burnett, Labat, and Dr. Chisholm, that it often continues much longer: further, Dr. Pym states, that “the *remittent* sometimes proves fatal on the second or third day; and according to Dr. Hunter it even runs its course in twenty-four hours. We have ourselves witnessed death on the third day, in a violent remittent imbibed in the month of September, in one of the most *northern* rivers of the United States. Lastly, respecting the sixth alleged diagnostic, the gangrenous state of the stomach, and the appearance of black vomit, Dr. Bancroft exposes the futility of such criteria, the first of which can only be known after death; and the latter “is the almost unerring harbinger of death.” The chief value of a diagnostic is to enable us to ascertain the true nature of a disease; but this refers to its consequences only. Neither is the black vomit peculiar to the continued form; for the authorities of Pringle, Cleghorn, Hunter, Rush, and Burnett, prove its occurrence in the remittent.

“I shall only add, concerning this black vomiting, that as it is a mortal symptom, never occurring, it may be said, *in those who recover*, and one which is often wanting among those who die, its appearance in this disease must be much rarer even than death; and this circumstance, joined to that of its *not* being ‘peculiar’ to the fever in question, render it very unfit to be produced as a diagnostic thereof,” p. 30.

Adverting to the inconsistencies contained in Dr. Pym’s account of the condition of the pulse and skin, “for which,” he says, “the Bulam Fever is remarkable,” the Author thus expresses himself:—

“Descriptions of symptoms being simply records of natural events in disease, which stand unalterable, however opinions about them may change, will the confusion, the inconsistencies, and errors, every where apparent in Dr. Pym’s attempt to frame a diagnosis for the Bulam Fever, be deemed very excusable in

one who claims merit for discovering peculiarities therein, which had escaped the sagacity and penetration of all other observers.”

We apprehend that sufficient has been said to show, that the question of the continued form of fever, or the Bulam, is merely one of degree; that the peculiarities which are said to distinguish the Bulam from all other fevers, do not exist; and that, therefore, the supposed distinct fever must be as imaginary as the peculiarities themselves.*

The second chapter is devoted to the consideration of other alleged peculiarities, more especially the non-liability to a second attack; which it is stated was brought under the notice of the Privy Council, in consequence of an application from Dr. Pym.

The merit of originality in this supposed discovery is disputed; Sir James Fellowes awards it to the Spanish practitioners generally; Dr. Pym claims it as exclusively his own, and fixes on the 20th day of October, 1804, as the period when that event took place in the garrison of Gibraltar.—The security, he represents, to be similar to that which an individual acquires by having undergone the small-pox. Now, Professor Berthe, in his “*Précis Historique*,” &c. published in 1802, gives an extract of a printed letter, dated at Cadiz, May 6th, 1802, in which the writer

* Dr. Musgrave, of Antigua, who also has successfully controverted all Dr. Pym's principal positions, remarks:—“Had Drs. Pym or Gilpin, or any one holding their opinions, practised in Antigua during the late Epidemic, still prepossessed with the idea of Black Vomit being distinctive of Yellow Fever, I venture to assert, without fear of contradiction, that he or they, (spite of every preconceived notion,) must in candour have admitted, that a disease at least answering in every respect the description given by themselves, could ostensibly be produced by miasmata alone; and that in comparing a mass of cases occurring in town and country, with Creoles and Europeans, a continued chain could be traced, link by link, from the most concentrated form as it invades new comers, to the simple intermittent, which we so frequently meet with among the slaves,” p. 123.—*Medical and Chirurgical Transactions*, vol ix.

plainly states, that, like small-pox, after one attack, a future seizure rarely occurs. This opinion, however, the Professor designates as fallacious and dangerous. In the epidemic of Cadiz also in 1800, towards the decline of the fever, the civil authorities of that place grounded their police measures on this opinion :

“ Guards were stationed at the gates, to exclude all persons from entering the city, who did not produce certificates of having already had the fever.”

Arejula had likewise pointed out the security afforded by an attack of the fever, in the epidemics of Medina, Sidonia, Malaga, and other places in Spain ; and states at page 319, that

“ At these places, and almost every other, he selected as assistants to the sick, those who had previously undergone the epidemics.”

So much for the originality of the alleged discovery, to the credit of which, even had it been confirmed by experience, we apprehend, on the principle of “ *suum cuique*,” Dr. Pym had no claim. As to the reality of this supposed “ peculiarity,” we consider the evidence adduced by Dr. Bancroft from the Reports of the naval medical officers, before adverted to, as well as the result of the examination of the different Journals of naval surgeons employed in the West Indies, to be perfectly conclusive in the negative. This opinion is corroborated by the answers of five army surgeons, and three assistant surgeons of the garrison of Gibraltar during the epidemic of 1814, to the questions proposed to them by Deputy Inspector Fraser ; they all bear distinct testimony to second attacks.

We can only briefly notice the author’s exposition of the frailty of Dr. Pym’s alleged proofs of absolute immunity after one attack. In the instance of the epidemic of Gibraltar in 1804, (on which the supposed discovery seems to have been founded,) it is stated,

that one hundred and twenty-two men who had escaped the fever, were found on inquiry to have been in the West Indies at some former period, which is inferred to have been the cause of their exemption; and that the 57th regiment, which had recently served in Trinidad, was introduced into the garrison, during the prevalence of the epidemic, with impunity. These are alleged to be proofs of the Bulam Fever not attacking a second time; but both instances obviously involve the assumption, that all who have visited the West Indies, have necessarily undergone an attack of Yellow Fever;—a fallacy we need not stop to refute. The instance of the men of the 10th regiment, which acquired their security by service in the *East Indies*, is still more palpably defective; because, Dr. Pym having laboured to prove that the Bulam has never appeared in the *East Indies*, the men of the 10th regiment could not, on his own principles, have obtained their immunity by previous attacks.

Indeed, it appears to us, that Dr. Pym has not steadily contemplated the security, constituting his alleged discovery, in a determinate point of view. In general, he compares it to the almost absolute immunity which an attack of the small-pox confers; but at other times he plainly speaks of it as, (what in truth it amounts to,) merely a relative security; for instance, in his account of the epidemic Yellow Fever of the 70th regiment in Martinique, in 1794, he says, every individual in the regiment was attacked; and, that three officers who had been several years in the West Indies, some time before, had it in so mild a form, as to make it unnecessary for them to be confined to bed:—again, the regiments in Martinique that had been some years in the West Indies, he says, were attacked, (in 1794,) equally with the corps lately arrived from England; but *with this difference*, that the former “*suffered a comparatively small mortality*.” And further, in the above-mention-

ed case of the 10th regiment at Gibraltar, he states, that "eight officers who had been in India, were attacked with the fever, and all recovered.—Seven officers who had not been in India, had the disease in so different a form, that five of them died." These we take to be fair illustrations of relative security, acquired by habituation to, or seasoning in, a tropical climate; and prove, that in order to obtain such comparative security, it is not necessary that the individual should have passed through an attack of Yellow Fever; while on the other hand, we may safely trust to the evidence adduced by Dr. Bancroft, to establish that one, or even a repetition of attacks, does not confer *absolute* non-liability.

We have been somewhat diffuse on this point, from a sense of its importance; and because we are anxious to exhibit the merits of the case in as distinct a form as our observation of the subject permits; and we refer to the evidence itself in support of our opinion, that the supposed non-liability to a second attack, so far from resembling the immunity after small-pox, is strictly a relative security, to be acquired as certainly, though more gradually, by tropical residence, (which involves habituation to the remote cause,) as by having passed through an attack of the disease;—a condition of the habit which confers security only when the concentration and force of the endemic causes do not exceed the degree to which the individual may have been previously habituated;—and, lastly, a mean of exemption which is liable to be destroyed by (e converso,) the regenerated susceptibility which a return to, and residence in a northern climate effectuate. That the exemption is absolute after one or more attacks, we consider to be perfectly, and most satisfactorily disproved; and we cannot well abstain from expressing our astonishment how Dr. Pym could ever have entertained such an idea, much less have vaunted it as a *discovery*; for

very little reflection might have shown him, that it *could not* have escaped the observation, but *must* have been evident to, and eagerly caught at by those who had passed a series of years amidst Yellow Fever, had such absolute immunity any existence. The facts included in the documents now brought forward by Dr. Bancroft, will, we cannot doubt, be deemed decisive; and consign to oblivion the premature notion of a discovery in a supposed "peculiarity," which he has proved, does not exist; and which, even for a moment supposing its existence to be any thing more than relative, had been pointed out, and acted on by the Spaniards many years previous to the 20th of October, 1804.

Dr. Fergusson, Inspector of Military Hospitals in the Windward Islands, in his Communication to the Army Medical Board, observes on this point,

"Another piece of doctrine has been promulgated from the writings of the authors above alluded to, (Drs. Pym and Fellowes;) that the Yellow Fever cannot be received by the same subject more than once. Of this we again, who live amongst Yellow Fever, not only know nothing, but we see it contradicted by the daily experience of our lives." Page 87.

We have always protested with Dr. Bancroft against the subtilty of making the black vomit a criterion of the Bulam Fever, and regulating the admissibility of the proofs of future attacks by that assumed standard. By acknowledging the legitimacy of such a criterion, as few or none recover after that symptom has appeared, a difficulty, nearly tantamount to impossibility, is incurred, of ever adducing in the course of even a long life, an unobjectionable instance of a second attack. When black vomit, and its usual immediate sequel, death, take place, the patient is relieved from future attacks of any kind; but in less aggravated forms of Yellow Fever, where

there has been no black vomit, and the patient has recovered, then in the event of a second attack, say the advocates for the Nova Pestis, the original one was not a case of Bulam, for one of our diagnostics was wanting; there was no black vomit!—and vice versa. Accordingly, we find this subterfuge incessantly resorted to. Against such sophistry, arguments are vain; and facts, for the reasons we have assigned, difficult to be applied. The Report of Inspector Fergusson from Barbadoes, amongst other cases of second attacks, contains, however, one decisive instance of even black vomit occurring twice in the same individual.—A patient of Dr. Caddel, a physician of the greatest experience in Barbadoes, miraculously recovered from yellow fever with distinct black vomit, “and died some years afterwards of the same disease, and with the *same symptom*.”—Against a fact of such decisive import, we know not what reply can be opposed, unless it be, “*Non persuadebis, etiamsi persuaseris*.”

In a rejoinder of considerable extent, Dr. Bancroft adverts to Dr. Pym’s examination of the authorities he has adduced in his Essay against the doctrine of contagion. He complains of a disingenuous and partial selection of those authorities for that purpose; and expresses his conviction, that they have passed the ordeal without injury.

“Here Dr. Pym closes the account of what he terms my authorities; and he manifestly intends to have it believed, that he has noticed and refuted *all* those which I had adduced; when in fact, he has completely shunned even the mentioning of nine-tenths of them. The few whom he notices were obviously selected only because they had said or admitted something capable of being distorted contrary to the real and sincere meaning of each; and in effecting this distortion he exults, as ‘having by cross-questioning my witnesses, brought out *the truth*,’ and ‘convicted

me upon my own evidence :’ although in regard to the great body of those who are more properly my witnesses, he is so far from having cross-examined them, that he has not even looked them in the face ; and my readers, I firmly believe, will be convinced that he has not been able to invalidate or weaken any *one* testimony or opinion which I had alleged to prove the fever in question to be void of contagion,” page 110—111.

A similar complaint is preferred of an equally uncandid and partial selection of some of his evidences against contagion, for the purpose of examination ; and the irrefragable character of the remainder is thence very justly inferred. We think it but an act of common justice to Dr. Bancroft, to insert in his own words, the recapitulation of the evidences against contagion, contained in his former volume, which Dr. Pym has not thought proper to oppugn, or even to notice ; leaving our readers to draw their own inferences as to the probable motives for such cautious proceeding.

“ I have now examined all that in any way merited notice of what Dr. Pym has advanced against my authorities and arguments, with the exception of some circumstances relative to Cadiz and Gibraltar, which are reserved for future consideration ; and I cannot but believe that my readers will have been convinced of the fallacy of those principles upon which he has endeavoured to explain, or rather to evade, my inferences, and of the abortiveness of his endeavours to invalidate, in a single instance, either my testimonies or my reasonings. There remains besides a great mass of evidence of which he has studiously avoided even the smallest notice ; and this must of course be considered not only as subsisting in full strength, but as having been deemed by him unquestionable and invulnerable : for otherwise, with his dispositions, and the latitude of every kind in which

he has indulged, it may be presumed, that it would not have been left without some hostile attempt. To this evidence, therefore, I refer my readers with confidence, and more especially to the very accurate and respectable one of Dr. James Clarke, at pages 332, 333, 334, and 760, 761 of my Essay; and that of Mr. Young, Inspector-General of Hospitals, and of all the superior medical officers of the army under Sir Ralph Abercromby in the Windward Islands, p. 334, 335; those of M. M. Desportes and Valentin at St. Domingo, p. 338—341; that of Doctor Hector McLean, with the opinions of Drs. Jackson, Scott, Wright, and Gordon, and nearly, if not all, the other medical officers of the British army in St. Domingo, p. 341, 342; that of Dr. Hume, p. 346, 347; those of Dr. Walker and of Dr. Grant of Jamaica, p. 350, 351; that of Dr. Ramsay, and of all the medical practitioners of the State of South Carolina, declared unanimously at a General Meeting in Charleston, p. 355, 359; that of Dr. de Rosset of Wilmington, in North Carolina, p. 359; the opinions of Drs. Valentin, Taylor, Hansford, Selden, and Whitehead, in Virginia, p. 360, 362; that of Dr. Davidge at Baltimore, p. 363, 366; that of Dr. Vaughan, in the State of Delaware, p. 367, 369; the opinions of many physicians at Philadelphia, between pages 372 and 386; and at New York, p. 387, 389; and those of Dr. Coit of New London, Dr. Wheaton, of Providence, and Drs. Warren and Brown of Boston, p. 401, 406. I request also the attention of my readers to the facts partly stated, and partly recapitulated between pages 406 and 430; and, finally, to the very important Official Message from the President of the United States on this subject to the two houses of Congress, p. 430, containing such an uncontradicted and incontrovertible statement of facts, as ought, in every unprejudiced mind, to remove every suspicion of the existence

of contagion in the Yellow Fever, at least, in that part of the world," pages 120—122.*

Although Dr Bancroft considers this quantity of uncontradicted evidence to be "more than sufficient to overthrow Dr. Pym's superstructure, more especially as the foundation of it has been removed in the first chapter of the present publication," he adduces a multiplicity of additional facts and authorities in proof of the local origin of Yellow Fever, and of its being destitute of the quality of contagion. Among other documents, one from New York is not the least curious, which proves from the Contagionists themselves, *that a Fever in every respect resembling the Bulam, prevailed in that city, nearly two years before the arrival of the Hankey at Grenada!* page 124—126.

In illustration of the identity of cause of the continued Yellow Fever, and of the recurrent forms, the following Extract from the Official Report of Dr. Dickson, the late able physician to the Leeward Island Fleet, will be duly appreciated.

"At Barbadoes and Antigua, I had generally seen the disease of an ardent *continued* form, and did not fully understand why authors talked of a Bilious *Remittent* Yellow Fever, until after the capture of the

* The above references include the opinions of Drs. Caldwell, Miller, and other eminent Physicians. Several other very recent authorities might be adduced who consider the Yellow Fever of Endemic origin, and concur in ascribing it to local causes and atmospherical influence—but to these a brief allusion only can here be made: see the Treatises of Doctors Girardin, Irvine, Reese, Le Fort, &c. and the accounts of Doctors Watts, Revere, and other Writers, in the different Periodical Works lately published in the United States. Doctor Watts, speaking of America, observes, "from one end of the Continent to the other, it has been officially announced during the last season, that the Yellow Fever was not communicated from one person to another, and not even in Hospitals where the sick have been admitted in great numbers."—*New York Med. and Sur. Register, Part ii.—Vol. 1, 1820.* See also, lately republished, the work of the experienced M. Devèze.—Paris, 1820.

French and Danish Islands. But the anomalies of fever, the shades and changes which it assumes according to the intensity of the exciting causes, (which *there were purely and wholly local*,) the state of predisposition, or the spot of residence, could no where be more strongly portrayed than in the destructive epidemic of Mariegalante in the autumn of 1808, from the most concentrated marsh miasmata; when the different types of fever were *converted* into each other, of the *worst and most aggravated species* I have ever witnessed. Some were affected with the *highly concentrated Yellow Fever* in the continued form; others with *comatose remittents* or *intermittents*, the exacerbations of which were so violent as to carry off a patient in two or three paroxysms; while others sunk into a low protracted character of fever resembling typhus," p. 143—144.

After stating the opinions of the Naval Medical Officers who reported on the question of contagion, Dr. Bancroft gives the following summary of them; from which it will be seen that the evidence against contagion is as great and uniform, as perhaps can ever be expected on any disputed point.

"Having stated the opinions delivered in the Reports transmitted to the Privy Council, it may be proper to give a summary of them; and, I will therefore mention that, of the twenty-four Gentlemen from whom these Reports were obtained, *three*, (Mr. Gregory, No. 12, Dr. Kein, No. 15, and Dr. Magrath, No. 17,) have omitted the statement of any opinion on the subject of contagion, as connected with the fever in question; *three* others, (Dr. Weir, No. 1, Dr. Blair, No. 2, and Mr. Tobin, No. 21,) have expressed their opinions that *it is contagious*: one of them, (Mr. Brien, No. 20,) declares his belief that, in individual or solitary cases, it is 'incapable of communicating itself to those who are contiguous,' but 'that, when several were labouring under the disease at the same

time, he believes it to be highly contagious.' And, another Gentleman, (Dr. Gardiner, No. 9,) appears to think, that *local* causes contributed at least as much to the production of the fever in Gibraltar in 1813, as contagion. Of the remaining *sixteen*, the majority have *absolutely* and *positively* denied the existence of any contagious property in this fever; and the rest have declared their belief, that it is not *naturally* or *properly* a contagious disease, although several of them are inclined to believe that it may, (as they suppose to happen with most other diseases,) acquire a contagious property by crowding, filth, &c. Most of the sixteen gentlemen, who declare that the fever under consideration is *not contagious*, have alleged decisive facts to support their declarations, some of which I have already quoted; and, I shall hereafter have occasion to notice some of the others," p. 178—179.

When we reflect that this evidence in great part proceeds from physicians to fleets, and surgeons of hospitals who have lived among yellow fever for a series of years; and, that the reports here adduced are few indeed, when compared to the great body of medical officers, who, with very few exceptions, we have had occasion to know, are uniformly opposed to contagion; when to these are added the opinions of Drs. Fergusson, Muttlebury, and Adolphus, who have long held official situations of the highest responsibility in the West Indies; when the number and length of service of those who have given their opinion so decidedly against contagion are considered,—the preponderance is immense; especially as far as the yellow fever of the West Indies is concerned.

It would appear, from the Report of the College of Physicians to the Lords of the Privy Council, that they entertain the opinion that Yellow Fever *may* prevail in the British Islands. They express their belief that "the cold of our climate would not prove a

preservative against the contagion," (of Yellow Fever,) because "it appears that during the months of October and November, when the fever raged at Gibraltar, Malaga, and Leghorn, the temperature was greatly below the average heat of our summer." This inference we beg leave to dissent from; and in extenuation observe, that the College in deducing such conclusion does not appear to have been aware of the necessity of a certain *preceding duration of high temperature*, which experience proves to be indispensable to the developement of epidemic Yellow Fever. Within the tropics the requisite degree of heat is never absent: and in those places without the tropics which have been occasionally visited by the disease, as North America, and the Spanish Peninsula, the meteorological observations of the various years in which it has prevailed concur in the pre-existence of high atmospheric temperature, for many weeks before the appearance of the epidemics. Temperature to this requisite extent seldom obtains in this climate; and when it does occur, is very transitory. Such evanescent influence is totally inadequate to the production of the disease; and while from insularity, or other causes, our climate retains its *mutable* character, we may, without temerity, discard all apprehensions of the existence of Yellow Fever among us. In corroboration of the steady pre-duration of high atmospheric temperature, as the "*sine qua non*" of the developement of epidemic Yellow Fever, the following extract from a provincial newspaper is not inapplicable.

"It has been ascertained from tables and records for the last twenty-four years, that in Philadelphia, the Yellow Fever does not prevail when the months of June and July do not exceed 70 degrees; but that in every summer since 1795, when the average heat of these months has exceeded 79 degrees, then the fever has raged; and that it has been most fatal in

those years, in which the thermometer has indicated the greatest altitude.—*Hampshire Telegraph*, Nov. 1, 1817.

In several of the Reports transmitted to the Privy Council, a belief is expressed that the Yellow Fever, although it does not originate in contagion, or legitimately possess such quality, *might* acquire it under accumulation of the sick, and deficient ventilation. The author admits, that the disease may be aggravated by such circumstances; but unconditionally denies the possibility of its acquiring such fortuitous contagious power. On this point, (as far as the *tropical* endemic is concerned,) we concur with Dr. Bancroft; because, on reference to our experience of many years in the West Indies, we cannot charge our recollection with any instance of Yellow Fever having manifested such contingent property of contagion, *under any circumstances*. One source of fallacious deduction on this point, seems to have been the too narrow limitation of the range of predisposition; for example, a ship enters an unhealthy port; her men imbibe the local noxious exhalations, and are exposed to the other remote causes of fever; she sails with a long list of fevers; the attacks continue at sea, in the order of predisposition, while the local source of the fever has been left behind some hundreds of miles, and is perhaps forgotten; the sick are unavoidably crowded, and at length, in the absence of the original cause, the seizures are ascribed to a contagious property acquired by accumulation; when in fact, the various periods of attack, should have been referred to the varied degrees of predisposition. In offering this explanation in favour of the ultra opinion, we merely state the result of our observation. Neither can we admit the justice of the inference, that such alleged contingent property is favourable to the doctrine of a peculiar and distinct disease, the *Bulam*; which its advocates contend is contagious *ab origine*, indepen-

dent of those fortuitous circumstances, under which only, some have supposed, (not proved,) the Yellow Fever to become contagious. Moreover, we imagine, that those most inclined to this opinion, will not agree with Dr. Pym, that it can be conveyed and re-conveyed across the Atlantic, and from one place to another; because we conceive that such a property, *if ever possessed*, is not of that permanent and imperishable nature to admit of transportation whenever the Contagionists wave their wand; but is dependent upon a casual, local, and transcient coincidence of agency; we therefore, agree with Dr. Bancroft, that it proves nothing in favour of Dr. Pym's view of the subject, its nature or origin.

We are glad to find, that the author has now bestowed due attention on a prolific source of fever under high temperature, the noxious exhalations from the foul hold of a ship. By disregarding this common cause of fever, a contagious origin has been erroneously assigned to fevers, which, making their appearance without exposure to land influence, could not be supposed to have sprung from an endemic source. Of the frequency of such a cause of even the most aggravated Yellow Fevers, no one can doubt after perusing the facts contained in the fourth chapter; to which we are the more desirous of directing the attention of our readers, because we are of opinion, that they will satisfactorily reconcile several seeming instances of contagious fever, with their true origin, an impure atmosphere from the exhalations from a foul hold. It is needless to dwell on the importance of the distinction; the history of the transports from Carthagera, in which the epidemic of Gibraltar in 1810, was reported to have been imported, will hereafter be shown to be a strong case in point. The accounts of the Regalia transport, by Drs. Fergusson and Mortimer, and of the Antelope and Childers ships of war, in which Yellow Fevers

of a destructive order recently prevailed from this cause, as attested by Dr. Crichton and Mr. Niell, will be read with the greatest interest. The observations of Dr. Fergusson will show, that had the *Regalia* arrived *a year later* in Barbadoes, she would probably have enjoyed equal notoriety with the much calumniated *Hankey*; the late sickness in that island would have been referred to a second African importation in the *Regalia*, and error thus confirmed. Dr. Fergusson concludes his observations on this subject with the following important Remarks.

“I am aware how much I have been favoured by circumstances, and what a different interpretation the facts I have collected would have borne, had the present epidemic that now afflicts the islands, (1816,) broken out in the ordinary course of seasons, *a year earlier*, at the time the *Regalia* was here; my task would then have been a much more difficult one, for these, (facts,) instead of assisting me to elicit the truth in the manner I have done, would in that case have been turned to the confirmation of error, and the perpetuation of the delusions, in regard to imported contagions,” p. 239.

From abundant experience of the danger, we fully coincide with the author in deprecating the practice of heaving down vessels of war, in the West Indies, in the ordinary routine of service at least; as well as from the excessive fatigue and exertion it demands, as because it is a process which requires for its execution, local security; or, in other words, a land-locked, and therefore, generally an unhealthy harbour. The instances of sickness and mortality from the effects of clearing a foul hold, in an unhealthy harbour, are numberless; Dr. Bancroft relates a remarkable one, amongst several others, in the “highly interesting” Report of Doctor Dickson.

“Of the production of Yellow Fever, accompanied, in twenty-two cases with *black vomit*, and consequent

death, on board the Circe frigate, principally from the duties of *clearing the hold and heaving down*; by which so many of the ship's company were soon after attacked with this fever, that a hundred and forty-six men were sent to the hospital at Antigua," p. 210.

The fifth chapter refers to the origin of the Spanish epidemics. In speaking of the Peninsula Fever, we wish distinctly to state, that our conclusions are drawn from the analogy of the laws of the Yellow Fever of the West Indies, with which our acquaintance has been sufficiently extensive; and as the Contagionists have themselves identified those diseases, we presume the propriety of reasoning by such analogy will not be disputed. By employing the term "*marsh miasmata*" to designate the exhalations from the soil, to which Dr. Bancroft in his former work, ascribed the origin of Yellow Fever, he has given his opponents an opportunity of apparently convicting him on his own evidence, by adducing the obvious inference, that where there is no marsh, the Yellow Fever could not have been caused by such miasmata. The topography of some places, where the epidemic has prevailed, as Cadiz and Gibraltar, but where there are no ostensible marshes, has been accordingly exhibited with exultation, as a positive refutation of his doctrine. The error arises wholly from the inadequacy of the term employed to express the origin of such miasmata; and to show that it is incorrect to ascribe to the author the opinion, that Yellow Fever is always the product of a distinct and ostensible marsh; we subjoin an explanatory quotation.

"In treating of the Ardent or Yellow Fever, as it has occurred at Gibraltar, Cadiz, and other southern parts of Spain, I ascribed its production to the action of those vapours, or exhalations which result from the decomposition of vegetable, or vegetable and animal matters, in a temperature of not less than 80°

of Fahrenheit's thermometer, and which are commonly called marsh or paludal miasmata; an appellation which, in compliance with custom, I had occasionally adopted, though I well knew, and had repeatedly declared, that such exhalations or vapours are often emitted from soils and situations which had no resemblance to a *marsh*," p. 253—254.

Again, in a Note, at page 91 of his Essay, he says, "I beg to state in this place, that, in joining the epithet *marsh* or *marshy*, to the terms miasmata, exhalations, effluvia, &c. and in considering these as a cause of fever, *I do not mean to intimate that such miasmata, &c. are emitted solely from marshes, (it being certain that they frequently arise from soils in a different state;)* but only to designate the quality of those vapours, which are eminently the product of *marshy* grounds."

This ought to have been a sufficient security against the misconstructions which his opinions on this point have suffered. With respect to the existence of paludal effluvia at Cadiz and Gibraltar, he adduces the prevalence during the summer and autumn of remittent fevers at those places, the acknowledged offspring of such exhalations, as indisputably demonstrating their presence and influence, however they may be produced, or from whatever source derived; and as further proof of the universality of this cause of fever throughout the Peninsula, the statement of Sir James M. Grigor is not irrelevant, which shows, that 22,914 cases of ague were altogether admitted into the British military hospitals in that country.

In the investigation of the alleged proofs of the importation of the various epidemics into Spain, the author has displayed his usual ability and research; and we must observe, that his exposures of the frailties, inconsistencies, and anachronisms, with which those statements abound, refer equally to the proofs of Sir James Fellowes, and of Dr. Pym. Of the first epi-

demic of Cadiz in 1800, he naturally asks, if the disease is *sui generis*, and has not appeared for thirty-six years previous to 1800; from whence was it imported on that occasion?

“There must have been somewhere on our globe, a spot on which this disease had existed not long before the time of its supposed importation, and where it was found to possess a contagious power. That they have either proved this, or that there is in fact any such place on earth, I most confidently deny.”

We cannot accompany him through his scrutiny of the pretended importations into Cadiz, in 1800, and into Malaga in 1803 and 1804; for these we must refer to the volume itself. The meteorological statements of Sir James Fellowes afford to our minds, an adequate explanation of the aggravation and epidemical extension of the usual endemic at Cadiz in 1800; while the gradual progress of the disease, and the imperceptible conversion of the ordinary and milder, into the more rare and exalted form, constituting yellow fever, as manifested by the difficulties and dissensions which the Spanish physicians experienced in their attempts to fix the date, when the usual autumnal fever could be said to have ceased, and the epidemic yellow fever to have begun, confirm us in our opinion, that the question of Bulam, or continued Yellow Fever, is truly one of degree, and not of specific difference.

The author's former remarks on the defective signification of the term “marsh miasmata,” to express the miasm of decomposition, are more especially applicable to the medical topography of Gibraltar, not unfrequently styled “*par excellence*” the Rock. The idea of the developement of paludal effluvia from a surface ostensibly so dissimilar to a marsh, has not merely been denied; it has been assailed by ridicule. The rarity of agues in Gibraltar has also been adduced in proof of the non-generation of those exhala-

tions at that place. This, however, as the author shows, betrays a very limited acquaintance with the modifications which are impressed on endemic fever by the influence of locality ; and while remittents are acknowledged to be the usual form of the autumnal fever in Gibraltar, (as well as in Cadiz,) we need take very little pains to prove the existence and influence of febrile exhalations from the soil, however ingeniously the speculators on the locality of an elevated rock, and on the absence of agues, may argue to the contrary. The examination of the importation account of the epidemic into Gibraltar in 1804, is prefaced by this observation.

“ At present, therefore, it will be sufficient for me to suggest as *obvious and prominent causes* of the epidemic in question, the accumulation of decomposable matters within the town *and the long prevalence of a dry and scorching east wind*, which produced a very high atmospheric temperature, without any salutary ventilation of the place, as it was completely obstructed in its course by the high mountain behind the town, *in and over* which the air was for many weeks nearly stagnant. A similar dry and scorching east wind, blowing with too little force to change and purify the atmosphere, has invariably preceded and accompanied every recurrence of the yellow fever at Cadiz, and other cities of Spain. And its effects, in the year 1804, were very extensive and remarkable,” p. 342—343.

We learn from the result of the inquiry into the alleged importation of that year, that Santos, the person who is accused of having imported the contagion into Gibraltar, from Cadiz, according to one account on the 28th of August, but according to another, on the 25th, left Cadiz several days *before* the time which Dr. Arejula, the chief official superintendant of all things belonging to the Andalusian epidemic, has declared to be the day on which the existence of

the yellow fever was first discovered at Cadiz. He could not therefore have imported a disease from Cadiz which had no existence there. The importation by Santos, has been attempted to be corroborated by the evidence of a Mr. Pratt, who was also in Cadiz, and from whom Santos is alleged to have derived his contagion, while they resided in the same tavern. But the author says, that a very cursory view of his examination is sufficient to make any one "sensible of the obvious and irreconcilable contradictions which it contains, and of the absolute impossibility of its being true." The affidavit of this person states, that he was taken ill while living in a tavern in Cadiz, about the 18th or 20th of August; that eight days afterwards, he had symptoms of black or bloody vomiting; that then, fearful of being sent to an hospital, he removed to another part of the town, and ultimately recovered; and that *after* his recovery he applied for a passage to Gibraltar in the same vessel in which Santos returned to that place, but was refused on account of his very yellow look. The *primâ facie* improbability of a person who laboured under black vomit, being able to shift his quarters from the apprehension of any contingency, needs not to be insisted on; but the conclusion of the story is fatal to its credibility, and destroys all relation between the deponent's and Santos's illness; for the vessel in which Santos returned to Gibraltar, and in which Mr. Pratt says, he was refused a passage *after* his recovery, left Cadiz, *at the latest*, on the 24th of August, (as Santos and Sir James Fellowes assert, and public records prove,) *several days before* the occurrence of the alleged *black vomit* in the course of Mr. Pratt's illness.

From such a tissue of contradictions, we know not what points can be selected as entitled to belief. The statements intended to establish the fact of importation, reciprocally destroy their respective foundations.

We, therefore, recur with unshaken confidence to the domestic origin of the epidemics; and proceed to show, that the bases of the subsequent attempts to fix the mode of importation are equally deficient in solidity.

A coincidence of local and atmospherical causes, similar to those which produced the epidemic of 1804, again aggravated the usual remittent of Gibraltar, (which had regularly prevailed there in every intermediate year,) towards the close of the autumn of 1810, to the degree of concentrated yellow fever. The epidemic of that year has also been alleged to have been imported by some transports from Carthage, crowded with French deserters. The substantiability of this allegation may be in some degree appreciated by stating, that it rests wholly on the gratuitous assumption of a breach of quarantine. Some cases of fever had appeared among the soldiers in the transports, previous to their arrival at Gibraltar, of which one man had died. Sickness shortly ceased after their removal into hulks provided for their reception, and it does not appear that the fever was there communicated to any person; but the contagious nature of the disease was inferred from the subsequent attacks of the seamen, who remained in the transports, and of Mr. Arthur, who was sent on board them from the garrison to treat the sick. The cause of fever in those vessels, the author justly ascribes to the noxious emanations from their holds, which, in a former chapter, he has shown to be capable of producing the worst yellow fevers. The attacks of Mr. Arthur and the seamen, are not proofs that the disease was contagious; the cause being local, every person exposed to its influence, might be expected to suffer, without the assumption of contagious agency. Dr. Bancroft refers to Dr. Burnett's previous statement in support of his rejection of the opinion of an imported contagion by these transports; but, it is necessary to re-

peat, that these vessels having been placed in strict quarantine immediately on their arrival at Gibraltar, the contagionists, in order to explain the origin of the epidemic by importation, are driven to the extremity of assuming a breach of quarantine. We would ask, if assumptions so perfectly gratuitous, be expected to be received as *bonâ fide* proofs of an affirmation, what fable, however preposterous, could be rejected on the score of want of evidence?

In the next epidemic in 1813, Sir Joseph Gilpin was at the head of the medical department in Gibraltar. In a letter to Dr. Chisholm, published in the *Edinburgh Medical and Surgical Journal*, in speaking of the contagious nature of yellow fever, and of its importation in 1793 from Africa in Grenada, he states, "of the infected state of the Hankey, I never did, nor ever shall, entertain the least doubt." This is certainly sufficiently declaratory of the tendency of his antecedent opinions. He says, that the first cases of the epidemic of 1813, occurred in two strangers, who imported it into Gibraltar on the 11th of August, in a vessel called the *Fortune*, from Cadiz, where he states, (very erroneously, as will be shown,) the epidemic in question prevailed at the period of their departure. Now, Lieutenant General Campbell, the Lieutenant Governor of Gibraltar, writes to Sir James Duff, the British Consul at Cadiz, on the 13th of September, 1813, stating, that some cases of fever had lately occurred in the garrison, "but that there was not one of a contagious nature, as they were peculiar to the season only." Here we have the highest authority that no contagious disease prevailed in Gibraltar for more than a month after the arrival of the strangers from Cadiz; and the non-existence of the epidemic at Cadiz, not merely at the time of their departure from thence, but for a considerable time afterwards, is proved by the testimony of Sir James Fellowes, who, in speaking of Cadiz, states,

at page 256, "in fact, until the end of August, the people collectively were, according to all the reports at the time, in a healthy state, and at page 261, he remarks, that it was only on the 14th of September that he observed any case in the British hospitals that excited his suspicions." These statements prove, (as in the instance of 1804,) that no disease prevailed at Cadiz, at the time of the departure of the *Fortune* from that port; she could not therefore, have imported a nonentity. Further, it has been seen, that more than a month elapsed after the arrival of the *Fortune* at Gibraltar, before the epidemic was observed in that garrison; on which point Dr. Bancroft observes,

"As Dr. Pym confidently asserts that the contagion of the *Bulam* produces disease *in four days*, at least in Gibraltar, its existence must have been made manifest by the occurrence of very many attacks within that interval; while, if it had been known to have produced *even one*, Sir Joseph Gilpin must have been highly culpable, had he not informed the Lieutenant Governor thereof," p. 375—376.

It is not a little curious, that "the garrison of Gibraltar was in strict quarantine *for several months before* the malady made its appearance, and a Board of Health was sitting *almost daily* on account of the plague which had broken out at Malta."

This circumstance, added to the *assumed* breach of quarantine in 1810, inevitably involves the dilemma, of either acknowledging the futility of quarantine regulations for the prevention of the *Bulam*; or otherwise, that the disease was not in either case imported. The advocates for quarantines are at liberty to choose their difficulty—the impossibility of supporting both positions is palpable.

The origin of the epidemic of 1814, the last which has occurred in Gibraltar, has not been attempted to be referred to importation, except by one individual, who advances no facts in support of his opinion. By

the replies to the questions proposed by Deputy Inspector Fraser to the medical officers of the garrison, seventeen in number, we learn, that twelve declared it to be their belief, that the disease originated in domestic or local causes, unconnected with importation. Three were neutral; one declined offering an opinion; and one only derived it from importation. The original documents adduced in proof of the domestic origin of the epidemic of that year, are too numerous for us even to glance at. We, therefore, take our leave of the subject of yellow fever at Gibraltar, by repeating our perfect concurrence with the author, after a deliberate consideration of the question, that the fever which has prevailed there epidemically several times within the present century, originated from local or domestic causes, and was destitute of any contagious property.

The seventh and last chapter contains an inquiry into the causes of the epidemics of Cadiz, and other places in Spain in 1810, and in some subsequent years; but, as the disease was avowedly the same with that of former periods, it will not be incumbent on us to notice all the particular subjects, which, in order to leave nothing relating to these epidemics without investigation, Dr. Bancroft has deemed it his duty to examine. With respect to the fever of Carthagena in 1810, which caused the deaths of 3000 persons in six or eight weeks, he observes,

“We are told by Dr. Burnett, (p. 274,) that Dr. Riseuno, Physician to the Spanish Royal Hospital there, ‘positively asserts, that the fever was brought from Cadiz and Gibraltar, in 1810;’ while Dr. Pym as positively asserted it to have been carried from Carthagena to Gibraltar. This last assertion has already been proved to be erroneous, (see page 359, &c.) and the former must be so, because the ardent yellow fever, or Bulam, did not appear at Gibraltar, (except in the transports,) until near the middle of

October, a month after the disease had been prevalent in Carthagena; and this observation is also applicable to Cadiz, which continued healthy till the middle of September, ‘before which time many deaths had occurred at Carthagena;’ and these contradictory assertions serve only to manifest the readiness with which the contagionists, who believe that an epidemic yellow fever must always proceed from imported contagion, hazard tales to account for it,” p. 415.

The history of an epidemic yellow fever, which prevailed in the 54th regiment at Stony Hill in Jamaica, has been brought forward by Dr. Pym, as a proof of the contagious origin of that disease. This opinion rests on the circumstance, that a detachment of the 54th regiment, which was sent from Stony Hill to Fort Augusta, and there quartered with a negro regiment and some European troops, became sickly: and that after their return to Stony Hill, fever passed through the whole regiment. It is not said from *whence* the contagion was derived; certainly not from the Negroes at Fort Augusta, who know nothing of yellow fever; nor yet from the European troops in those quarters; nor is it stated, that the other regiments in the same quarters with the detachment of the 54th, were not affected by the fever. “If therefore no contagion existed in Fort Augusta, none could have been carried to Stony Hill.”

This statement had already been controverted by Mr. Doughty in his valuable publication on Yellow Fever.

“That the 54th Regiment was attacked with the aggravated form of yellow fever, as described in these letters, (published by Doctor Pym,) I readily admit; and, that the other corps in the same quarters did not suffer, as stated by Mr. Rocket, I also most firmly believe. Now, as Mr. Redmond and Mr. Pym agree that the fever which prevailed in the 54th regiment

was highly contagious, and Mr. Rocket asserts the other corps remained unaffected with it, I ask from what source did the 54th imbibe its contagion? The fever developed itself at the season when the endemic cause prevailed, and which might that year be more powerful, and exert its influence to a wider extent, than it had done the preceding years. The soldiers of the 54th were susceptible of its influence, whilst those of the other corps were not in the same degree; because one of those latter regiments had been in the island, to my knowledge, not less than *three*, and the other *six* years, and a great part of the time in quarters, annually visited with yellow fever." *Observations on Yellow Fever*, p. 54.

There remains the history of another epidemic yellow fever, recorded by Dr. Pym as owing its origin to contagion, which we are somewhat surprised to find that Dr. Bancroft has omitted to notice; more especially as his local knowledge of the scene of the transaction, (with which we also have some acquaintance,) would, we apprehend, have rendered the task of its refutation void of difficulty. We allude to the fever of the 70th regiment in Fort Edward, Martinique, in 1794; and refer to Dr. Fergusson's excellent topographical remarks on Fort Royal; (Med. Chir. Trans. Vol viii. p. 119 to 122,) and also to Mr. Mortimer's introductory letter to his valuable report on Yellow Fever, published in the Medico-Chirurgical Journal, in proof, that the sickness, of that regiment, attributed by Dr. Pym to contagion, (Obs. on the Bulam Fever, p. 10—14,) depended wholly upon local and indigenous causes.

We conclude this subject with the author's exhortation respecting the preconceived opinions of contagion, which strangers usually carry with them into tropical climates; but which, in by far the majority of instances, ultimately yield to a more intimate ac-

quaintance with the habitudes of the disease in question.

“I earnestly request my readers attentively to reflect upon the facts stated in this chapter; and especially upon the readiness with which numerous medical men, respectable by their characters, their conduct, and their professional ranks, have come forward to make confessions which are generally felt as in some degree humiliating, by acknowledging, that they had, when they first arrived in the regions of yellow fever, entertained opinions, deeply fixed in their minds by the ordinary course of medical education, which however, after more extensive observation and better means of information, they had found reason to abandon as erroneous, and been forced to adopt conclusions directly the reverse, in regard to the alleged contagious nature of the yellow fever. This is stated to have been done by Dr. McLean, Dr. Fergusson, and all their colleagues on the hospital staff at St. Domingo; it was done also by myself, and almost all on the hospital staff in the Windward Islands, (see the letter of Mr. Young, Inspector General, on this subject, at page 385 of my Essay;) it was done by Dr. Dickson, and as he declares, generally by others in the circle of his acquaintance; and, beside many others, it will soon appear to have been done by Dr. Erly at Sierra Leone, on the very coast where Dr. Pym and Dr. Chisholm pretend to derive their Bulam fever. In all these cases, the change of opinion has been made spontaneously and disinterestedly, by the silent and gradual, but certain operation of truth; and without any desire to gain credit by a supposed preservation of many lives from a danger which had no existence, and without any of those views to promotion and reward, which may have produced some of the exertions and erroneous statements lately made, in regard to the fever under consideration,” p. 189—191.

On the subject of typhus within the tropics, we think Dr. Bancroft has somewhat, and with advantage, modified his former opinions; for his admission, page 174, seems to sanction a greater latitude of inference, than could be deduced from his former volume, respecting its being carried as far as Barbadoes. We also are of opinion, that typhus may, and does exist occasionally within the tropics; and we have seen what we consider to be the unequivocal cases of that disease on the Atlantic Equator; but we coincide with the author, that the climate is extremely unfavourable to the existence and perpetuation of typhus contagion, and that it ultimately exhausts itself.

Upon the occasional occurrence of a hybrid disease, which Dr. Bancroft simply alludes to as having noticed in his Essay "without either approbation or disapprobation," we do not profess to offer any decided opinion. It is known, that Sir John Pringle, Sir Gilbert Blane, Dr. Lempriere, and others, have spoken of a mixed or hybrid fever; and we have understood, that Dr. Dickson is of opinion, that he has seen some instances which favour the existence of such character of disease; where the appearance and duration of the symptoms were so intermediate between typhus and yellow fever, that it was difficult to say, to which order of fever they most belonged. But we believe, at the same time, that he considers such occurrences as extremely rare; that he has not detected any satisfactory evidence of their possessing an infectious quality; and that under the influence of climate, they soon disappear, and are succeeded by the legitimate endemic of the West Indies. Such questions can only, we conceive, be ultimately decided by those who may enjoy similarly extensive opportunities of witnessing the disease under all varieties of circumstances and character.

We conclude by expressing our sense of the ingenuity, acuteness, and research, which the author has

exerted with equal facility and effect in the present elaborate production; and we are satisfied, that the voluminous mass of irrefragable evidence which he has been enabled to adduce, will impress conviction on every unprejudiced mind, of the perfect triumph he has achieved by the complete refutation of the opposite opinion, of the existence of the Bulam as a distinct contagious fever, attacking but once. In the preceding analysis, we have aimed at the inclusion of the most prominent parts of the discussion; for its length we plead the importance of the inquiry, and the desire to diffuse a portion, at least, of the information with which the pages of this "Sequel" are enriched, as well as to contribute our mite to the advancement of what we consider to be the cause of truth, and to the correction of a popular error; for as the author justly observes in his conclusions, the supposition of the existence of contagion "accords with the prejudices and apprehensions of the greater part of mankind, who are prone to believe that all diseases are contagious when they become generally prevalent." To those whose lot and duty it has been to alleviate the sufferings inflicted by yellow fever, and who, therefore, with us, naturally feel a peculiar interest in the discussion, we need not say more to induce them to avail themselves of the information and experience accumulated in this volume.

Topographical Remarks, illustrating the causes and prevention of the Tropical Endemic or Yellow Fever, by Dr. DICKSON, F. R. S. Ed. F. L. S. Fellow of the Royal College of Physicians of Edinburgh, and late Physician to the Fleet, and Inspector of Hospitals in the West Indies.

——— Quod sol atque imbres dederant, quod terra creârat
Sponte sua. LUCRET. Lib. v.

SEC. III.—As the knowledge of a disease is of interest in proportion to its danger or frequency, and as the means of prevention depend upon a correct appreciation of its causes, the investigation of the laws which govern the Tropical Endemic is confessedly of the highest importance.—With this view I offered some topographical remarks on the Etiology, and Prevention of the Yellow Fever, in the 13th Vol. of the Edinburgh Medical and Surgical Journal; and, on the present occasion, I have endeavoured, by the addition of several observations and illustrations, still further to elucidate the subject.

Marsh Miasma has been very generally, and justly considered as a grand source of the fevers of warm climates; and it is a very frequent, though not the only source of the destructive form of the Tropical Endemic. While its operation has been too exclusively insisted upon by some authors, it has been admitted under great limitations only by others. The term, indeed, is not free from objection, since it has caused the latter to receive it in a sense far too strict and literal, and to question the existence of such exhalations, except in the vicinity of a complete swamp or marsh.

I am at present to consider the miasmata of decomposition, with reference to their effect, and not to their intimate nature, in whatever situation they may oc-

cur; and, in this general sense, it appears to me, that, in a temperature so uniformly high as that of the West Indies, and where decomposition is so rapidly promoted by the agency of heat and moisture, there can be very few places where the occasional production of noxious effluvia may not be calculated upon on shore; and sometimes, also, on ship-board. Of fever arising in particular ships, from impure exhalations emanating from a foul state of the hold, continuing notwithstanding every attention to preventive measures, and ceasing only upon the hold being cleared, I have seen many well-marked instances. As the most unseasoned part of a ship's company, and especially strangers, will be most liable to suffer; in this case, it is easy to perceive that such attacks might sometimes be construed in favour of infectious fever; but that they proceeded solely from the source above mentioned, appears to me clearly demonstrated by the previous inefficacy of ventilation and cleanliness,—by the impunity with which promiscuous intercourse, elsewhere, is maintained with other ships,—by the extinction of the disease upon the hold being cleared, and not till then,—and by its not being propagated or communicated by the sick, when removed from its original source. I shall adduce one example, where, from the peculiar construction of the vessel, the source of the febrific exhalations could be more clearly ascertained than when they arise from a foul state of the ballast in general. In April, 1807, a fever prevailed in the Dart, lying guard-ship at Barbadoes, which, at first, was attributed to land influence, and irregularities committed by the men employed on shore; but as it continued from time to time, to attack new comers especially, after sleeping two or three nights on board, an internal cause became suspected. The ship was divided into compartments below, so as to allow of the water being carried in large tanks or cisterns, instead of

the usual manner; and these, having been disused in harbour, their bottoms were found to be covered with an offensive deposition of slimy mud. On the 17th of May, cases of fever still supervening, I find by my notes that this evil had been detected, and remedied; and communications between the divisions had been opened, so as to allow a free circulation of air below; and on the 24th I find it stated, "for the last week no fresh attacks of fever have occurred on board the Dart." The fatal cases terminated at the hospital with the usual symptoms of yellow fever. As such fevers may occur at various periods after exposure, consequently, after the cause has been removed, the early cessation of the disease, in the present instance, is more material, where the ship was constantly receiving new men; because their not being affected subsequently, showed that the cause which had existed previously, existed no longer.

Impure effluvia will be most apt to be generated in a new ship, particularly if built of green wood; or where the shingle ballast has not been restowed for a length of time, or had not been, originally, carefully selected. If such exhalations, (between which and animal effluvia, confined or produced by the human body under disease, a wide distinction obtains, though their effects have been often confounded,) be admitted to occur, occasionally in a man of war, where cleanliness is proverbial, it is easy to perceive, that, by the agency of heat and moisture, they may, under particular circumstances, in a transport or merchantship, become so abundant and concentrated, that the hold, without the expression being very figurative, might be denominated a ship marsh.*

* A very apposite and striking illustration of this remark has subsequently appeared in the account of the sickness in the Regalia transport, by Drs. Fergusson and Mortimer.—*Vide Medico-Chirurgical Transactions*, vol. viii. p. 108; and Bancroft's "Sequel," p. 217, et sig. In the latter able Work, several other

But a grand source of obscurity and of contradictory opinions appears to me to originate from a want of attention to those different states of the system, involving a great diversity of liability to the Yellow Fever, from the lowest grade of European susceptibility to the highest degree of disposition to the disease, short of actual Fever. Consistently with this diversity, it follows that a quantum of cause altogether innoxious and insignificant in the former, would be fully competent to induce the disease in the latter state of the system; hence it is easy to understand, that according to the gradations in the scale of susceptibility will be the power of the noxious impression; and moreover that, what in one subject would constitute a predisponent, in another, possessing a higher degree of disposition, would prove an exciting cause of the Yellow Fever. I have here used the word Disposition instead of Predisposition, (though I should have preferred the more familiar term,) because it might be contended that the latter ought to imply an original, or, at least, a previous, rather than an acquired tendency.

The degree of such disposition may fluctuate considerably during the earlier period of an European's residence in the West Indies, according to his age, habits, locality, the season of the year, and as various stimuli have a greater or less influence upon the system; or, in other words, in proportion as it has been freely and suddenly, or cautiously and gradually exposed to their operation. In such a climate, where the youthful, sanguine temperament is, at any rate, goaded by the stimulus of unnatural heat, into a degree of febricular excitement, it is not extraordinary that, from free living, intemperance, or undue exposure or exertion, there should be much danger

instances of Fever, arising from an impure state of the hold, are extracted from my official Report to the Naval Medical Board, and other sources.

of this artificial excitation terminating in real fever, until the system becomes gradually inured, and less sensible of such influence by the effect of habit, or assimilated by the supervention of, what have been called, seasoning, or milder attacks of sickness.

The dangerous increase of susceptibility may be often observed in ships recently arrived from Europe, continuing healthy, while refitting in harbour, for ten days, a fortnight, or longer, according to the season, and becoming very sickly afterwards. Its variation, and decline, are sufficiently exemplified in the disparity of health enjoyed by the crews of ships under repair, at the same time, and in the same harbour, and exposed to precisely similar exciting causes, but differing in the length of their residence in a tropical climate, or the degree of exposure or sickness to which they had been previously subjected. The variation in these respects will cause such dissimilar results, that a fatal fever will become general, in a short time in one ship; in another the sickness will be partial, and less dangerous; while a third will be altogether exempt, or experience only mild and occasional attacks. This gradation will be sufficiently obvious, although its uniformity may be somewhat affected by peculiarities in season, modes of discipline, and various minuter causes, while the chief circumstances are apparently the same.

The danger of a West India climate, or, in other words, the tendency to yellow fever, I conceive, then, to be in the compound ratio of the disposition, and the force of the exciting cause; a weaker exciting cause being sufficient when the system is strongly disposed, and *vice versa*; for, fortunately these often obtain in an inverse proportion; and the constitution has been more or less habituated, previously to any considerable exposure. How greatly the preservation of health must depend upon the inurement being gradual, is too obvious to require any comment. The

degree of security, however, that may be acquired, will be relative; for the susceptibility will be less after an attack of this fever,—or from being habituated to miasmata, or other remote causes, than from mere length of residence.

Marshy effluvia, or similar impure emanations in other situations, I have already stated to be, in my opinion, a great source of yellow fever, either as a predisposing or exciting cause; but, if the above premises be correct, it further follows, that the causes of yellow fever may be the same as the remote causes of fever in general; that they may act in various degrees of intensity, or combination; that the weaker require the aid of disposition, to become efficient; but when the system is highly excited, or prepared to fall into fever, that any additional agency, though of itself inoperative and insignificant, may become the occasional cause; and consequently, that this disease may be called into action, in some cases, by such as are feeble, dissimilar, and so obscure as to elude investigation.

In speaking of causation, then, I do not mean to express individual agency, but any concurrence of circumstances which constitutes a cause; for I imagine we can seldom, in pathological physics at least, calculate upon either singleness of cause, or simplicity of effect. If the preceding principles are well-founded, it will not be necessary here to enter into any length of illustration to show, that sporadic cases may arise, in this way, at all seasons of the year, from insolation, or undue exposure, intemperance, fatigue, or other irregularities, as well as from circumstances so minute, as often to escape detection; that a number of men, such as a regiment, or a ship's company, or any part of them, from similarity of temperament, employment, or situation, will often suffer simultaneously, particularly during the hurricane season, and all the latter half of the year; and that in

particular years, from previous unseasonable weather, or an epidemic constitution of the atmosphere, and in all years, during the sickly months, when a considerable number of unassimilated men have been recently introduced into the West Indies, the yellow fever may be expected to become general among them, and to be attended with great mortality, particularly after much exposure and exertion, often inseparable from active warfare. As the constitution will suffer less excitement from the heat, the coming from another part of the torrid zone, or a southern climate, will confer a certain degree of protection, but this will be only sufficient to guard against the weaker, or ordinary causes of yellow fever. The gradation which I have above attempted to explain, is well illustrated by the following unstudied, but impressive extract of a letter, from Mr. Sheppard, now lying before me :—
“ While we were all ill, and dying in the Alligator, in English Harbour, shortly after our arrival in the West Indies, the Emerald, which had been two or three years in the climate, remained near us healthy, though under precisely the same circumstances of duty and exposure. The Emerald was succeeded in her situation by the Carysfort, fresh from Europe, which ship, in a few weeks, buried almost all hands.”

From regarding the habits, as well as the ætiology of the tropical endemic, the laws which govern its appearance seem to me to be entirely different from those of the plague and typhus fever, with which it has been sometimes compared. To those disorders, strangers, and the natives of the countries in which they prevail, are *cæteris paribus*, obnoxious in the same degree ; and all such as are equally exposed, may be said to be equally endangered. But it is totally different in the legitimate yellow fever in the West Indies. It is the disease of manhood, of the excited, unassimilated, full habit. It more rarely

attacks an earlier or later period of life ; and seldom females, or only in proportion, as from intemperance or other causes, they approach to the habit of the male sex ; while old residents, whether native or assimilated, and people of colour, though subject to remittent and other milder forms, may be said to be almost entirely exempted from this severe form of disease,—for they are so, with as rare exceptions as we witness in the application of any other general rule.

But whatever may be the peculiar coincidence of circumstances, or modification of cause, most fertile in the generation of yellow fever, an uniformly high temperature is the *causa sine qua non*. This is literally and eminently entitled to be so denominated, because it indispensably precedes the effect. In the Carribean Archipelago, the temperature is not only high, but equably and durably so ; and from its little variation in this respect, I consider the yellow fever as the legitimate product of the climate ; for in the more southern colonies on the Continent, where, from the vicinity of woods, mountains, &c. the temperature, though often as high, is not uniformly so, and where the winds are more variable, and the nights cooler, the disease is much less prevalent, and oftener assumes a remittent type.

To the importance which I attach to an equably high atmospheric temperature, it may be objected by some persons. that, in countries which should be still more favourable to this disease, because the heat is more intense, and also in places lying in the same latitude, the yellow fever is not known. But, in the first place, it becomes incumbent on such persons to show, why a temperature above a certain height ought to be more favourable ; for, on the contrary, I should expect that great heat would dissipate and destroy, if not prevent the formation of the miasmata of

decomposition; and, secondly, it by no means follows that the climate of two places is alike, because they lie at the same distance from the equator.

M. Humboldt remarks, that the salubrity of tropical climates depends more on the dryness of the air, than on any of its other sensible qualities: "The burning province of Cumana, the coast of Cora, and the plains of Caraccas, prove that excessive heat, alone, is not unfavourable to human life."

All historians concur in admitting the different laws to which the corresponding degrees of the two hemispheres are subject, with respect to the distribution of heat and cold; for the exceptions, from local causes, stated by Calvigero, cannot affect the general principles. The difference in the same latitude has been estimated at 12 or more degrees; but according to relative situation, it must be often much greater.

The dissimilarity of climate, between the eastern and western sides of the New Continent, from this cause, and from the greater variableness of the wind, is also noticed by various writers, and particularly in the voyages of Ulloa, Anson, and others.

At Lima, which is but a little further on one side of the equator than Carthagená is on the other, the heat is far more moderate; and the observations made by the academicians at Quito show, that, from its elevated situation, although close to the line, the thermometer does not rise there so high in summer as it does in Paris; nor does it fall so low as in the temperate climates of Europe in winter, so uniform are the seasons. See Rees, Pinkerton, Walton, &c.

This disparity of the Old and New Continent, and of places lying in the same parallel, is sufficiently accounted for upon philosophical principles, and depends on the elevation, depression, extent, or configuration of country, direction of the winds, nature and cultivation of the soil, proximity and height of mountains, vicinity of the sea, and many circum-

stances which modify the temperature of a climate, besides its distance from the equator, and the consequent more vertical, or more oblique incidence of the solar rays.

Dr. Robertson observes, “while the negro on the coast of Africa is scorched with unremitting heat, the inhabitant of Peru breathes an air equally mild and temperate, and is perpetually shaded under a canopy of grey clouds, which intercepts the fierce beams of the sun, without obstructing his friendly influence. Along the eastern coast of America, the climate, though more similar to that of the torrid zone, in other parts of the earth, is nevertheless considerably milder, than in these countries of Asia and Africa, which lie in the same latitude.”

He afterwards shows, that the trade wind is still further cooled in its passage from the Atlantic to the Pacific shore of the New Continent. “As this wind advances across America, it meets with immense plains covered with impenetrable forests, or occupied by large rivers, marshes and stagnating waters, where it can recover no considerable degree of heat; at length it arrives at the Andes, which run from north to south through the whole Continent. In passing over their elevated and frozen summits, it is so thoroughly cooled, that the greater part of the countries beyond them hardly feel the ardour to which they seem exposed by their situation. In the other provinces of America, from *Tierra Firmè*, westward to the Mexican empire, the heat of the climate is tempered in some places by the elevation of the land above the sea, in others by the extraordinary humidity, and also by the enormous mountains scattered over this tract.”—*History of America*, vol. II. p. 9, *et seq.* 9th edit. Hence the great salubrity of the table-land, in the centre of New Spain, compared with the low marshy lands upon the coast.

On the opposite sides of Mexico, where the dis-

tance is so much less than across the other parts of the Continent, the influence upon disease is yet considerable. Thus we learn that although bilious fevers and cholera morbus prevail, the black vomit has never yet been observed on the west coast of New Spain, while Vera Cruz is considered as the chief seat of that terrible distemper.

The disastrous results of the expeditions to Carthagena, Porto Bello, Vera Cruz, &c. which have been the theme of the historian, and of the poet, have, indeed, fatally proved the peculiar noxiousness of the extremely hot, alluvial, and marshy soil of the eastern shore.

Even in the short distance of 60 miles, between Panama and Porto Bello, the difference is sufficiently perceptible, although, from improvements, it may be less so of late years. Ullea remarks, that the garrison detachments sent from the former to the latter, "though coming from a place so near, are affected to such a degree, that, in less than a month, they are so attenuated, as to be unable to do any duty, till custom again restores them to their strength;" and that "the inhabitants of Panama are not so meagre and pale as those who live at Carthagena, and Porto Bello."—Translation by Adams, vol. i. p. 98, and 123, 4th edit.

I am the more anxious to advert to these points, because they assist in explaining the influence of locality and susceptibility in the production of yellow fever.

For, besides the lower and more variable temperature and winds on the extensive coast washed by the Pacific Ocean, the introduction of Europeans is more gradual and limited, and their constitutions may be supposed to have lost that freshness, (if I may use the expression,) so favourable to this disease, by the length of the voyage and climates through which they must pass; or by the seasoning attacks, to which they are

liable before they reach their destination, if they land at an eastern port.

There are two powerful reasons, then, why Europeans, on the other side, are so much less subject to yellow fever : They have not only lost a considerable share of their original susceptibility by pre-assimilation, but their equatorial parallelism is so far counteracted by the difference of climate, that they may be considered, though *actually* living in the same, as *virtually* living in a more northern latitude.

The converse of this proposition appears to me well adapted to explain the occasional appearance of the fever which has excited so much controversy in America and in the south of Europe. *During the unusual and long-continued height of the thermometer, by which these epidemics have been preceded, the inhabitants are virtually placed in a new or tropical climate ; and the same general effect follows which would result from the sudden transition of a body of men to the West Indies, with a considerable share of northern susceptibility. In both cases the constitution, being unassimilated to the change, will be liable to be affected by the unusually heated and peculiar state of the atmosphere, whether its influence may be admitted to consist in producing the dispositional tendency of which I have spoken, or the developement of those miasmatal products most favourable to this form of fever, or in both.*

Hence the natives of the torrid, and of the temperate zone, are upon a very different footing in respect to susceptibility. For while the former may be considered as exempt from yellow fever, the inhabitants of the United States, and of Spain, (though probably somewhat less liable than more northern strangers,) cannot be seasoned against it by any length of residence in their native country. For, from the variations of temperature to which they are exposed, they may be expected to lose during the winter any degree of assimilation they may have acquired during the

almost tropical heat of the preceding summer; and, (like the natives of the Antilles after residing a certain time in Europe,) they become liable to be attacked by the yellow fever, when the thermometer has maintained, for a certain period, the degree of heat necessary to produce the requisite disposition, or the evolution of sufficiently concentrated miasmata.

As illustrating the grounds upon which the occasional appearance of the yellow fever may be anticipated in ultra-tropical situations, and at the same time pointing out some of the sources by the remedying of which the chance of its occurrence may be diminished, I shall here introduce the remarks of M. Devèze, on the locality of Philadelphia, quoted from the second volume of the *Quarterly Journal of Foreign Medicine and Surgery*, p. 434—5.—“ M. Devèze enters upon the first chapter with a topographical description of Philadelphia; and from its situation upon a plain on the banks of the Delaware, intersected by large ditches, from which the winter's rain can only escape by evaporation, carrying along with it the detritus of the clay soil, and the vapours and gasses arising from the decomposition of the vegetable and animal substances which cover their banks; from the sudden transitions of temperature and humidity of the atmosphere, not only in regard to its annual or monthly variations, but in respect to what usually takes place within the twenty-four hours; concludes that Philadelphia from these combined causes, must frequently not only be the seat of sporadic cases of fever, but also of the more destructive epidemic forms of this disease. That the character of the fever which appears in the southern parts of the United States, should put on the same form with the fevers of tropical climates is indeed almost to be expected, from the excessively rich, deep, and absorbent nature of the soil; combined with the other adventitious circumstances of stagnant pools and ditches,

filth of various descriptions, gasses arising from decomposed organized remains, floating in an atmosphere, whose temperature, during the summer months, almost exceeds that within the tropics, and which, according to M. Devèze, was found by the French emigrants at Philadelphia more debilitating than they experienced at St. Domingo.”—*Traite de la Fièvre, Jaune*; Par Jean Devèze, 1820. See also the grafical remarks of Dr. Robertson; and those of Dr. Girardin on the topography of Louisiana.

M. Devèze, moreover, found that the quantity of electric fluid existing in the atmosphere was there extremely variable; and that the number of insects was unusually great, during the hot months, when the epidemic raged in that city,—a strong indication of insalubrity. It may be proper in this place to remark that, in such climates, results drawn from the greatest and smallest elevations of the thermometer at certain periods, give no information respecting the mean temperature; for, from inattention to this point, in discussing the question whether the heats might be considered as extraordinary in epidemical seasons, it has been affirmed that the heat was greater in some healthy, than in unhealthy years, because the thermometer rose a few degrees higher in the former than in the latter.

Upon ultra-tropical yellow fever I do not propose to offer any observations at present; but I am inclined to believe, that the discrepancy of opinion is much to be attributed to partial and incomplete views of disease in limited and detached situations; and that the more we see of fevers in the various quarters of the world, the more we shall be induced to refer to general but determinate principles their phenomena, as well as their mode of action or effects upon the body, though the latter, of course, will be susceptible of great diversity, according to the nature or concentration of cause, individuality of constitution and

structure, and relative importance of the organs particularly affected.

In his celebrated work on the political state of New Spain, to which I have already alluded, M. de Humboldt seems to have justly appreciated the influence of uniformity of temperature, situation, and individual susceptibility, in the production of yellow fever. I shall quote from my notes, as I have not the book before me. He is of opinion that the yellow fever has occurred sporadically whenever persons born in a cold climate have been exposed in the torrid zone to air loaded with miasmata; and he very properly cautions us against confounding the period when a disease was first described, with the date of its first appearance.

The yellow fever, he informs us, is still unknown at Acapulco, though, from the uniformity of the heat, he is apprehensive that, if ever developed, it will continue the whole year, as in other situations where the temperature varies only two or three degrees during the year; and he most judiciously remarks, that, if this port, instead of being frequented by ships from Manilla, Guayaquil, and other places of the torrid zone, received ships from Chili, or the north west coast of America, if it were visited at the same time by a great number of Europeans, or of Highland Mexicans, the bilious would probably soon degenerate into the yellow fever, and the germ of this last disease would develop itself in a still more fatal manner than at Vera Cruz. M. Humboldt afterwards gives a still more satisfactory reason why it is not brought from Chili, viz. that it does not exist there;—which I imagine to be not a little applicable to the Bulama, and some other instances of imputed importation, like that from Siam, characterised by Dr. Lind as “truly chimerical.” For, after stating that the yellow fever has not appeared upon the coast of the Pacific Ocean during the last fifty years, except at Panama, and that there, as at Callao, the

commencement of a great epidemic is often marked by the arrival of some ships from Chili, he adds, not that they imported the disease from a country where it never existed, but because the inhabitants coming from the healthiest country in the world, experienced the same fatal effects of a sultry air vitiated with putrid emanations, as the inhabitants of the north. See the 4th Volume, by Black, and the 29th Number of the *Edinburgh Medical and Surgical Journal*.

The same reasoning, I may observe, particularly applies to the error which has been so often committed, of mistaking epidemic for contagious diseases, and supposing them to be imported by new comers, because, from unassimilation to the new atmosphere, they are generally the first and greatest sufferers from local causes. Thus, Ulloa states, though he does not seem to believe it, that, when the black vomit first appeared at Guayaquil in 1740, the galleons of the South Sea having touched there, it was the general opinion that they had brought that distemper, and that great numbers died on board the ships, together with many foreigners, but very few of the natives.—Adams, vol. i. p. 161. I need hardly remark how infinitely more probable it is, that the sailors, coming from a pure air, suffered from the unhealthy marsh in the vicinity, which Estalla describes as infecting the city, at particular seasons, with pestilential vapours; but which to the natives, from habituation, were comparatively innoxious. Even in ordinary seasons, in the West Indies, it is not unfrequently observed, that men, though partially seasoned in one place, are, nevertheless, liable to be again attacked by fever upon their removal to another, or even to a different part of the same island; and this sometimes happens, although the latter may be esteemed as healthy, or even a healthier situation; proving the influence of a new, or in some respect differently modified atmosphere, or of other circumstances which

the apparent locality, though it may in some degree, is insufficient wholly to explain.

It is therefore probable, that in different places and seasons there is not only a difference in the power or intensity, but in the nature and combination of febrific miasmata, upon which the increased liability to sickness, on a change of residence, may, in a great measure depend.

Indeed, we not only observe striking peculiarities in the features of disease, in different climates, but often a considerable change in the state of health from a seemingly inconsiderable change of situation; and if such effects happen from modifications of climate, soil, or other circumstances, for which we are so often unable to account, it is necessarily much more to be expected that strangers arriving at the commencement of a sickly or epidemic season, should be the earliest victims; and thus, erroneously, they have been sometimes thought to have brought a disease, merely because they were the first affected by new miasmata, or other local causes, increasing the susceptibility of a habit probably already prone to febrile or inflammatory action.

As for the reasons already given, and from personal observation of the tropical endemic in almost every variety of situation—proving it to arise in hot, low, moist, close places, when new men are exposed to miasmata, intemperance, insolation, or fatigue—I must consider the yellow fever, not as an imported or contagious disease, but as a strictly local and indigenous evil, “*quod sol atque imbres dederant, quod terra creârat sponte sua,*” to use the words of Lucretius in a different application. I shall only remark here, that if it possessed any contagious property, it is to me altogether unaccountable, that conviction thereof should not have been coerced, almost with the force of mathematical demonstration, long before the present day, considering the continual and unrestrict-

ed intercourse generally carried on between ships, as well as between the opposite sides of the Isthmus of Darien. But, on the contrary, examples of individual disease, or of a limited number only, are constantly occurring in the same ship, again and again, without extending further; and it becomes epidemic, as I have endeavoured to explain, only when a generally operating cause produces a general effect. Hence it is legitimately endemic in the West Indies, and becomes often epidemic there at particular seasons, and occasionally, in other countries, after exposure to the influence of tropical heat. If the fever of Gibraltar and other parts of Spain be the same disease, and if it possess any such property, which I consider as still remaining to be proved, I must therefore contend that it is not a native, but an adventitious character, and that, like other diseases attended with febrile action in temperate climates especially, it is susceptible of being modified by the occasional coincidence of peculiar circumstances, such modification placing it in a class which, in my official report on the subject to the Naval Medical Board, (perhaps inaccurately, but for the sake of distinction merely,) I called *Diffusible Disorders*, the power of dissemination in such not being, as in other communicable diseases, native and inherent, but contingent and acquired.* Although

* Although decidedly of opinion that the yellow fever of the West Indies is not a contagious disorder, and that the climate is highly inimical to the very existence of contagion, Dr. Dickson does not mean to deny the abstract *possibility* of any fever becoming so, under particular circumstances, at least in temperate climates; but he contends, that a distinction ought to be made between an inherent, and an adventitious property. In a former communication to the author he observes, that he uses the term *Diffusible Disorders* to express not a native and permanent, but an acquired and temporary power of dissemination; and he proposes indicating the degree of such power by a change of termination. Thus using the same epithet, [for the propriety of which he does not contend, but only for the sake of illustration,] a *diffusive* disease might signify that which can or may diffuse itself; and

I do not mean here to enter further upon the question of the Peninsula fever, yet, as its progress has been considered by some to be satisfactorily traced, and its prevalence to be unaccounted for by any supposition of an epidemic change of the air, or endemic origin, without a reference to contagion, I may be permitted to remark, in passing, without dwelling upon the inference, that, in the latest work upon the subject, and in which this opinion is temperately supported, the concurrence of a certain height of temperature, and of a combination of circumstances difficult to define, but connected with the climate and individual predisposition,—is nevertheless admitted to be necessary to the existence of the disorder.

Indeed, stronger evidence of a highly deleterious state of the atmosphere, as exemplified by its pernicious influence upon animal life, in these instances at least, cannot well be adduced, than that furnished by the author of the reports himself; for, in the fever at Cadiz in 1800, Sir James Fellowes, I believe in page 45, speaking of the air, says, “its noxious qualities affected even animals; canary birds died with blood issuing from their bills;” and he quotes the authority of Arejula in further proof of similar fatal ef-

a diffusible one, that which can or may be diffused; the latter requiring for this purpose the co-operation of a peculiar, but transitive coincidence of circumstances. For such purposes, he remarks, we have the potential *active*, and potential *passive* adjectives as they are called by Horne Tooke. Belonging to the *former* we have the termination *ive*, borrowed from the Latin, and *ic* from the Greek:—belonging to the *latter* we have, (from the Latin *bilis*,) the terminations *able* and *ible*; and also the contraction *ile* having one common signification.—Scaliger distinctly points out the force of the two terminations *ilis* and *ivus*, ‘*duas habuere apud latinos, totidem apud græcos, terminationes—in ivus activam in ilis passivam, &c.*’ Dr. Dickson further suggests whether, in speaking of absolutely contagious or infectious diseases we might not, by the noun substantive or adjective, indicate a *greater* or *less* degree of such power; as in the *latter* by the terminations *osus* and *ivus*, &c. *ex infectiosus* and *infectivus*. “*Hæc omnia infectiva appellantur.*” —Vitr.

fects upon domestic animals, particularly dogs, cats, horses, poultry, and birds.

In equinoctial regions the effect of elevation, (as indeed was conjectured by some of the ancients,) is equivalent to that of latitude. We are informed, that the farm of *L'Encero*, beyond Vera Cruz, which is 3043 feet above the level of the Ocean, is the superior limit of the *Vomito*; and that the Mexican Oaks descend no further than this place, being unable to vegetate in a heat sufficient to develop the germ of the yellow fever. The situation of Vera Cruz, indeed is peculiarly adapted to establish the nature and indigenous origin of this disease. The traveller by the ascent of a few hours is carried beyond its reach, from the rapidity with which the ground rises to the westward, for it is not felt beyond ten leagues from the coast; while, conversely, the Creoles who inhabit the elevated table-land of New Spain, where the mean temperature is about 60°, and where the thermometer sometimes falls below the freezing point, when they descend the eastern declivity of the Cordillera, are plunged as it were at once “unanointed, unannealed” into the extremely hot and deleterious atmosphere of Vera Cruz, and suffer even in a greater proportion than European strangers who approach it gradually by sea. In fact, these Mexican Mountaineers in descending from Perote to the coast, in sixteen hours are transported from the temperate to the torrid zone, and by this sudden change are exposed to all the dangers of a new and fatal endemical disease. This concentrated variety of climate, and its influence on the vegetable, as well as the animal creation, is depicted with such force and beauty by Baron Humboldt, that I cannot resist laying before the reader a description which, in a few lines, carries him from the burning plains in the vicinity of the sea, to the regions of perpetual snow: “The admirable order with which different tribes of vegetables rise above one another

by strata, as it were, is no where more perceptible than in ascending from the port of Vera Cruz to the table-land of Perote. We see there the physiognomy of the country, the aspect of the sky, the form of plants, the figures of animals, the manners of the inhabitants, and the kind of cultivation followed by them, assume a different appearance at every step of our progress.

As we ascend, nature appears gradually less animated, the beauty of the vegetable forms diminishes, the shoots become less succulent, and the flowers less coloured. The sight of the Mexican oak quiets the alarms of travellers newly landed at Vera Cruz. Its presence demonstrates to him that he has left behind him the zone so justly dreaded by the people of the North, under which the yellow fever exercises its ravages in New Spain.

This inferior limit of oaks warns the colonist who inhabits the central table-land how far he may descend towards the coast, without dread of the mortal disease of the vomito. Forests of liquid-amber near Xalapa, announce, by the freshness of their verdure, that this is the elevation at which the clouds suspended over the ocean, come in contact with the basaltic summits of the Cordillera. A little higher, near La Banderilla, the nutritive fruit of the banana tree comes no longer to maturity. In this foggy and cold region, therefore, want spurs on the Indian to labour, and excites his industry. At the height of San Miguel pines begin to mingle with the oaks, which are found by the traveller as high as the elevated plains of Perote, where he beholds the delightful aspect of fields sown with wheat. Eight hundred metres higher the coldness of the climate will no longer admit of the vegetation of the oaks ; and pines alone there cover the rocks, whose summits enter the zone of eternal snow. Thus in a few hours, the naturalist, in this miraculous country, ascends the whole scale of

vegetation, from the heliconia, and the banana plant, whose glossy leaves swell out into extraordinary dimensions, to the stunted parenchyma of the resinous trees.”—Political Essay on the Kingdom of New Spain, translated by Black, vol. ii. p. 251—2.

In accounting for the tropical endemic becoming epidemic at particular seasons, the eminent traveller just referred to, further shows the intimate connection on the coast of Mexico, between the progress of the disease, and the temperature and state of the seasons; and, accordingly, that, at Vera Cruz, the *vomito prieto* does not commence generally, till the medium heat is 75° Fahr. It is, therefore, seldom seen in December, January, and February, unless it has been very violent in the summer, when it continues more or less through the winter; but, as he observes, although it is hotter in May, its ravages are more dreadful in September and October, because a certain duration seems necessary to develope its full force; which must, moreover, be augmented after the rains have ceased, which last from June to September, as well as be influenced by the direction of the winds. The same increase of disease, I may remark, is observed in the islands, during the hurricane months; and this is also in proportion as the previous weather has been unseasonable; but the medial heat at which the disease begins to be prevalent, may be calculated at, at least, from 5° to 10° degrees higher; from which it may be deduced, that, in proportion as the air is more loaded with miasmata, as on the Atlantic shores of New Spain, the disease may become active at a lower temperature, than when these effluvia are less abundant and concentrated; and it may further account for its appearance beyond the tropics, during the summer heat.

In proof of the effect of seasons, I have now before me a letter from Doctor Macarthur, who ably conducted the Naval Hospital at Barbadoes for several

years, corresponding with his report to the Medical Board in September, 1809, in which he says:—"I remarked, while at Barbadoes, that the fever was more frequent, and more violent when the rains were partial, than when continued and general. The heat of the sun produced the decomposition of animal and vegetable substances more rapidly when the earth was slightly moistened by rain, than when perfectly drenched. In these years, when the rain fell abundantly during the months of June, July, and August, the fever did not appear until September, October, and November. On the contrary, when June, July, and August, were comparatively dry months, the fever invaded us earlier.—We know in Europe that the effluvia from marshes are more deleterious a week or two after the beginning of dry hot weather, than immediately after the rains are over; the first evaporation from the surface of the marsh being innoxious, compared with that which afterwards follows." Upon the same principle, as has been well explained by Dr. Bancroft and others, it is not during excessively wet or dry seasons, but sometime after the rains, or after partial showers, that marshy effluvia are most abundant and concentrated, as I saw dreadfully exemplified in the garrison epidemic at Mariegalante, in the autumn of 1808. At certain seasons, therefore, in hot countries, wherever there are vegetable and animal life and decay, even though no water be stagnating on the earth, the whole flat surface may be considered as a marsh; and, consequently, there can be very few situations, as I mentioned at the commencement, exempt from the occasional influence of such miasmata.

It is only by tracing its connection with the seasons, then, that we can rationally expect to unfold the laws of the tropical endemic, and such topographical hints as I have here offered, if followed up, I should hope would materially contribute to this end, although

the peculiar and intimate combination of circumstances, as well as its sporadical occurrence, must often depend upon causes so minute as to elude all investigation.

The degree of exemption from the disease will be, generally, conditional, and contingent upon various circumstances; for though indemnity to a considerable extent may be purchased by a previous attack, or by mere length of residence, yet such protection is but relative, and, though a sufficient security against ordinary causes, is not proof against such as are of great intensity.

The *Circe* frigate, after having been several times at Antigua, and escaping with a limited number, or only individual instances of yellow fever, by putting to sea before it became general, entered English harbour, which was then healthy, on the 4th of January, 1808, no man requiring medicine. In five days afterwards the fever appeared, and, from being engaged in the unwholesome duty of clearing the hold, and heaving down, between that period and the 2nd of February, 146 men were sent to the hospital, of which number 22 died with black vomit, although it was then the healthiest season of the year, and the ship had been nearly two years and ten months in the West Indies.

Still, though the immunity was far from amounting to insusceptibility, the danger here was much lessened by partial assimilation; for it may be fairly inferred, that the mortality would have been much greater if the ship had been recently from England.

A great proportion of these men had suffered previous attacks of fever; and I think there can be as little doubt, that some of them, at least, would have terminated in the same way, if they had not been controlled.

As the degree of immunity will be modified by various circumstances, so will the success in the treat-

ment of the yellow fever be modified by season, situation, severity of the attack, habit of the patient, &c. But, without entering into any detail upon the mode of cure, which I have treated of elsewhere,* and which is ably laid down in the following pages by others, I shall content myself with observing shortly, that though success will be greatly influenced by locality and constitution, and though the symptoms of this malady do not always permit, nor can they, where they do authorize, be always arrested by the copious abstraction of blood; yet I feel justified in saying, that it is only from this remedy, employed while the fever is forming, or within a short time after it is formed, aided, of course, by purgatives, and by the cold affusion, if indicated, that we can entertain any plausible expectation of arresting a disease where the morbid motions are of such inordinate power and rapidity. In making this remark, I more particularly allude to that which I have most frequently witnessed, the ardent continued form of this disease, where the deceitful pause, during the transition from one stage to the other, has been so often mistaken for a remission. To admit the effects of the morbid action upon the stomach, contiguous intestine, and brain, often in the course of a few hours, would appear to me equivalent to admitting that we could only rationally hope to counteract them by such powerful means, provided we put aside preconceived opinions and theory.

The ability with which men bear the loss of blood, I have already allowed very much to depend upon habit and locality; and its efficacy entirely on the early stage of the disease.

In situations peculiarly pestilential, or where, from concentration of cause, the animal energy is so far depressed, as early to incapacitate the functions for

* Edinburgh Medical and Surgical Journal, vol. 9th.

the performance of those duties by which life is supported,—or after sufficient time has elapsed to have allowed the establishment of fatal congestions,—I do not pretend that there is any hope of these being removed, but, on the contrary, death will be accelerated by the use of the lancet. All I mean to say is, that, during the first stage, at least in the shape in which I have most frequently seen the disease, and while the progress of inflammation in the most vital parts is rapidly proceeding, yet still remediable, I am acquainted with no other remedy which has either time or power to save them from disorganization.

Having had but too many opportunities of being convinced of the want of commensurate efficacy in those ineter means by which the fevers of temperate climates are often conducted to a safe termination, I feel perfectly satisfied when I hear of great success in the treatment of this disease, either that results so fortunate have been the reward of a prompt and decisive plan of treatment at the very commencement, or that the disorder was of a far milder, and more remediable nature, than that which I have been accustomed to, under the name of yellow fever. Would to God I could say, that the most prompt and decisive measures will be generally attended with success; but I may say, that this will almost entirely depend upon the earliness of their application; or upon the judgment to determine when the disease has so far advanced, that they are no longer applicable, and must be succeeded by an immediate, and entirely opposite mode of treatment.

The mediocrity of remedies often causes them to retain that reputation which they have previously, and sometimes unjustly acquired; but the power of a remedy so active as venesection, yet whose utility is so entirely dependant, not only on time and quantity, but on the varying state of the system, is in continual danger of being rated too high or too low. I am sorry,

therefore, to observe, that it is spoken of with too much confidence by some writers ; because this tends on failure to bring its character into disrepute with others, though it oftener suffers from the opposite extreme of unfounded apprehension.

Upon the now undisputed and general utility of purgatives, it is quite unnecessary to say any thing here : they have not only the great advantage of being eminently serviceable where blood-letting is proper, but where it cannot be resorted to, and in a vast variety of milder cases of fever, where it is not required.

The general healthiness of the West Indies, as well as of particular Islands, varies considerably in different years, and at different periods. It is liable to be affected by certain states of the air, as unusually wet, or dry and close, or otherwise unseasonable weather for the time of the year, by calms, by variations, (especially to the southward,) from the usual trade winds, and in the quantity of the Electric Fluid, and, in certain years, by what has been termed “an Epidemic Constitution of the Atmosphere.”

Individual safety in the Western Hemisphere will be best consulted by attending to the comprehensive maxim of Celsus—viz. by avoiding various predisposing and exciting causes, until the physical sensibility of the system is reduced by habit ; and in proportion as this advice is adhered to, the Naval Practitioner may be assured that not only the chance of sickness will be greatly diminished in his own person, but that in a well regulated ship, aided by the earnest and judicious co-operation of the officers, the lives of the men under his charge may be preserved to an extent beyond his expectations, in ordinary seasons and circumstances.

During war, indeed, when the influx of unassimilated Constitutions is considerable, and especially after much exertion and active service, great sick-

ness and mortality are, I fear, unavoidable; but generally speaking, the result will depend upon the number of Europeans introduced, the time and situation chosen, and the exposure being limited at first, and gradually increased, or otherwise. It is, therefore, of the utmost consequence that bodies of men, whether soldiers or sailors should arrive in that country at the coolest season of the year, (and if such can be selected as have previously served in a warm climate they should invariably be preferred;) that the former should be sent to the healthiest Islands, or positions at first; gradually exposed to duty under a vertical sun, and instead of being quartered in the low, hot, alluvial ground, in the vicinity of the towns skirting the leeward bays, that their barracks should be built on hills of moderate elevation, sufficiently distant from marshy, damp ground, infested with insects, and from thickly wooded ravines, where the rank and luxuriant vegetation bespeaks the existence of exhalations unfriendly to health.

The importance of such selection was eminently exemplified by the saving of health and of life that accrued from the erection of new barracks for the troops, in a more interior and elevated situation, after the capture of Guadaloupe, in 1810, by Admiral the Hon. Sir Alexander Cochrane, then Governor of the Island. The humanity of this measure, and the judgment previously displayed by the Commander in Chief in the scite and construction of the Naval Hospital at Barbadoes, &c. have been warmly and deservedly eulogized by the most experienced men in both services; suffice it to mention the names of Drs. Jackson* and Mc. Arthur:—to me it may be permitted to pay a not less just and earnest tribute of respect to that unwearied benevolence which prompt-

* Vide Jackson's Sketch of the History and Cure of Febrile Diseases, 1817—pp. 386—and 392-3.

ed his immediate attention to every proposal for the welfare of the seamen, and insured not only his concurrence, but active co-operation in whatever could add to their comfort in health, or alleviate their misery in sickness.

The healthiness of the ships stationed in the Caribbean Sea, will very much depend upon the state of discipline, and degree of attention paid to the crews. It will be especially preserved by staying in harbour as little as possible; and by cruizing to the northward, or resorting to Halifax, or elsewhere, during the hurricane season, or when repairs which will require detention for any length of time in port are necessary. In fine, it will chiefly depend upon avoiding all undue exposure to the sun, rain, night air, fatigue, intemperance, and unwholesome shore duties; and upon attention to different regulations, and preventive measures, of which I have had ample opportunities of appreciating and stating the value, from the inspection, and the medical reports, of generally between sixty and seventy vessels of war.

Many of these being of a local and temporary nature, it would be needless to specify here; but I may shortly notice that the intermission of labour during the hottest hours of the day, working as much as possible under cover, giving a portion of cocoa before going to duty after sunrise, wearing flannel, injoining a soluble state of the bowels, serving spruce beer or sound wine instead of rum, and when this could not be done, issuing the latter of a certain age and quality, and finally, (for of the victualling, in the improved state of the navy, it is unnecessary to speak,) the adoption of every means to diminish the frequency of intoxication, were the chief of those measures from which the most beneficial effects were observed.

But of all occupations the most desirable to avoid is that of clearing a foul hold in the West Indies;

and, therefore, whenever it is possible, ships requiring this to be done should be sent out of the country: for not only is it highly dangerous in itself, on account of the noxious gasses disengaged, but because it is generally necessary to perform it in a secure, or land-locked, and consequently unhealthy harbour, such as that of Antigua.

Where the subject is of such importance, though at the risk of tautology, I request leave, in conclusion, to repeat, that the bad effects of staying in port too long at one time, and of harbour duties, particularly early in the morning and after the setting of the sun, as well as during his meridian power, cannot be too strongly adverted to; and, therefore, a measure of paramount importance is the employment of negroes, natives of the country, or at least of men accustomed to the torrid zone, in wooding, watering, transporting stores, rigging clearing, careening ships, &c. and in fine, in all such occupations as must subject men to excessive heat, or deleterious exhalations, which cannot fail of being highly dangerous to the health of the unassimilated European.

But the great object, I conceive, is to relieve the ships on that station, (the prospect of which, alone, has a wonderful effect on the health and spirits of the men,) so often that a foul state of the hold, and the necessity of cleaning it in that country, shall as seldom as possible arise. During the most active period of nearly eight years of the war, considerable sickness and mortality must necessarily have occurred; but in that time, I have likewise had the great satisfaction of witnessing, in various ships, and on various occasions, that a degree of health was maintained in that climate beyond my most sanguine expectations,—particularly latterly, when the season of active warfare being past, the necessity was precluded, and consequently the unwholesome duties of clearing the hold, heaving down, or undergoing lengthened re-

pairs in the close harbours of the West Indies, were interdicted; and I am therefore led to conclude, that to avoid the stonger exciting causes of yellow fever, is, to a great extent, to escape the disease.

Observations on the locale of Yellow Fever, by Dr. FERGUSSON F. R. S. Ed. Inspector of Military Hospitals.

SEC. IV.—The principal West India towns and garrisons for the troops are situated on the leeward shores of the country, at the bottom of the deepest bays that can be found, as a protection to their trade against the winds from the sea. The soil must consequently be alluvial, and is often marshy. Nine-tenths of the towns are inclosed by high hills rising immediately behind them, which exclude the sea-breeze that, in its natural course, ought to reach them from the windward side of the country. As their elevation is generally little above the level of the sea, we have abundant reason to conclude, that if the highest degrees of reflected tropical heat, defective perfusion, and the miasmata that reside in marshy soils, or may be formed in the drier alluvial ones by heavy rains, can produce aggravated remittent fever, it must happen under such circumstances, especially where police and cleanliness are entirely disregarded.

The settlements of the planter, in like manner are formed, not on the elevated mountain ridge from which the periodical rains have washed away the soil, but in the alluvial ground, beneath, where his labour can with more certainty be turned to profit. Nor is it to be wondered at, under such circumstances, that a body of raw troops or young civilians, come to settle in town or country, should be swept away by tro-

pical fevers. The wonder is why it does not happen with more unerring certainty; for there are seasons, and even courses of seasons under apparently similar circumstances of heat and moisture, when even the declared swamp is comparatively innoxious to the newly arrived European, and still more so to the seasoned inhabitant. This begets in the young adventurer or hardened votary of wealth, a fatal delusion of confidence which, though so often exposed by the melancholy recurrence of fatal fevers is never cured.

The pestiferous quality of miasmata does not appear to depend *necessarily* either upon aqueous or vegetable putrefaction, however frequently it may be found combined with both. Every one knows that the miasmata are not generated from the body of the lake or pool, but from its drying, or half-dried margins. The swamp is no more than this margin rolled up under another shape. Water, without being absorbed by the subjacent soil, gives out no febrific effluvia. One of the healthiest quarters in the West Indies, is that of the field officers on Berkshire hill, the bed room of which is placed over a deep stone reservoir of water. But this said febrific miasma is very certainly generated from the *paucity* of water where it has previously abounded, provided that paucity be short of actual dryness. To the production of this a high atmospherical temperature is indispensable;—and in proportion to the intensity of temperature is the intensity of power in the miasma produced, varying its effects on the human frame, from the ordinary ague of Europe, and the West India Mountain fever, to the highest degree of remittent, and yellow fever, which is never found remote from the level of the sea. It is comparatively innoxious to those who have had the good fortune to become habituated to its influence; and attacks with singular peculiarity of selection the robust, the young, and the healthy, in their first approach to its abode. If these

be granted, I think we may be able to explain from the various compositions of soil, its elevation, aspect, and texture, as affording capacity to retain moisture, why every dry one can be brought, during an uncommonly wet season, through the influence of tropical heat, into the state of a marsh that gives out noxious vapours; while a marshy one approaching to dryness through previous drought may be made perfectly healthy from the same abundant rains. Thus Barbadoes, which from its cleared calcareous soil, is far more salubrious, in general, than Trinidad, has been lately afflicted severely with the worst forms of yellow fever; while the latter island remained perfectly healthy. In both places it has rained abundantly—particularly in Trinidad, whose extensive marshes have been overflowed; while the alluvial soil on the shelves of table-land at Barbadoes has been converted into a temporary swamp. So at St. Lucia, when the garrison on the lofty position of *Morné Fortuné* is healthy during the fine dry weather, the inhabitants of the town of Castrus, at the base of the same hill immediately below, and within half cannon shot, are visited by the worst fevers, and *vice versa*:—The dry weather gives activity to the miasmata which the rains dilute, refresh, or condense, at the same time that they are forming pools, and temporary swamps on the shoulders of the hill, immediately beneath the barracks, on the summit of *Morné Fortuné*.

So a deep ravine, impervious to the rays of the sun, and free current of air, that has been a water course, may still, after its surface appears dried by the summer heat, retain sufficient underground moisture to give out the most dangerous miasmata—the more dangerous because the more concentrated for want of perflation;—and so, in fine, salubrious and insalubrious soils may, under such circumstances, change

places, in regard to health; and localities in the neighbourhood of each, under the same modifications of climate, be very differently affected.*

It has been inferred that yellow fever belongs to a different family from that of intermittent, because it seldom occurs at the same time with, or breaks off, in convalescence, into ague. Ague indeed is not a common production in the hot, low-land on or near the level of the sea—where alone the yellow fever is found. It is very rare, for instance, to hear of an ague originating in the leeward sea-port town of Basseterre, Guadaloupe, either amongst the troops or inhabitants; but in the barracks on the cool marshy hills above the town, at an elevation of less than a thousand feet, it is a very common disease, among officers and soldiers, while their comrades in the town are devoured by concentrated remittents. The same may be said of nearly the whole of the West India towns. They are all so marshy that, in colder latitudes, they could not possibly escape agues, which however, very seldom originate, and are nearly unknown amongst them. The inhabitants of Barbadoes boast that they are exempt from agues, though the island has several marshes. Thus the reason is plain:—There are very few ridges there of sufficient elevation to belong to the region of intermittents, even supposing their sides to be marshy, which they never are. The swamps are all in the lowest levels of the land; and when their morbidic miasmata act upon the

* The reader is probably aware that some Authors, as Dr. Jackson and Mr. Doughty, consider an excess of the principle of Vegetation as the cause of Fever: "It would appear that the materials of vegetation abounding in excess, acted upon by a powerful cause, give out a principle, which not being expended in the growth and nourishment of Plants, is diffused to a certain extent in the atmosphere, occasioning a derangement of such bodies as come within the sphere of its action."—Jackson's Outline of the History and Cure of Fever.

human body, they produce the greater or less concentrated forms of remittent fever, according as their powers are regulated by the temperature and climate of the season, or as the subject is presented under more or less favourable circumstances of seasoning, excitement, &c.

I am far from presuming to deny, says Dr. Fergusson, that there are fevers from pure excitement; *“for soldiers and others have been attacked and died of yellow fever before they landed in the West Indies, or could be exposed to the influence of land miasmata in any shape.”* From this it would appear that a calen-
ture, [the synocha of Cullen,] the pure offspring of heat, as pneumonia is of cold, runs a course similar to the yellow fever.

“To the argument that the highest degree of concentrated remittent or yellow fever, should neither remit nor break off into ague, it seems sufficient to reply, that for any disease to observe regular laws, it is necessary that the vital organs principally affected should continue in a certain degree of integrity; that their functions should only be disturbed and perverted to a given point; that they should still be discernible as functions, and not be utterly overwhelmed and extinguished by the violent cerebral action and speedy gangrene of the stomach that take place in aggravated yellow fever. As the ulcer of a specific poison that would run a regulated course according to acknowledged laws, if it be driven to a high inflammation or sphacelus, no longer belongs to the original stock, and is emancipated from those laws; so the violent actions of the above fever impair and destroy the animal functions by which its crisis and remissions are regulated, or speedily engender a new disease; as new as the conversion of an ordinary venereal chancre into a phagedenic slough, through the application of a potential cautery.”

I may refer to the section on *Bilious Fever*, in the first edition of my work, for a similarity of doctrine.

By *Malaria*, Dr. F. means to express something that is more decidedly than miasmata the product of underground moisture, which can only be sublimated, so as to produce its specific effects, by long-continued solar heat—a more subtle miasm, in fact, of which the surface gives no warning, but of which the existence is proved from its effects on habitations that are placed in the drought of the dry ditches of forts, no matter how rocky or dry, if they are deep, and also of deep ravines. At Fort Matilda, in Basseterre, Guadaloupe, a well-raised artillery store-house and guard-room, placed in Bouchure, at the confluence of two of the ditches, was found to be utterly uninhabitable. The same malign influence affected the houses that were placed opposite the deep ravines of rivers, no matter how pure and pebbly the channel, as also all the dwellings situated on the leeward base of the mountains.*

It would also appear that these effluvia, during certain states of stagnation of atmosphere, as during the sultry calms of the hurricane months in the West Indies, *accumulate* in the dirty ill-ventilated streets of West India towns, to the danger of all who are unseasoned to their influence. Here *strangers* will have the highest degree of ardent fever.

It is probable, too, that the healthiness of seasons in unhealthy climates, depends less on the *amount* of heat and moisture, than on the *ventilation* of the climates by powerful, regular trade winds, like the trade winds between the tropics; for whenever these have been withheld for a time, the accumulated morbid emanations from underground moisture will act upon the human body, like the accumulated typhoid

* See the section on Sicily..

principles in crowded hospitals, when undiluted with a due proportion of atmospheric air.*

I shall conclude this section with some observations on the Fever of Mariegalante, in the West Indies, communicated to the Author by Dr. Dickson.

The history of the fevers at Mariegalante, from July to December, 1808, is not only well calculated to show the destructive powers of concentrated marsh miasmata, in tropical climates, at certain seasons; but also the modifications of fever which arise according to intensity of cause, locality, atmospherical vicissitudes, epidemic influence, or degree of constitutional predisposition. The difference of effect, however, as marked by difference of type, or anomalous appearances, is here particularly worthy of attention, because the men were limited to a small space, insulated and exposed to the same causes which were strictly local and indigenous, but affected by differences of temperament or habits, degree of habituation or exposure, and other relative circumstances. I can, however, only propose here to give a hasty and imperfect sketch of the sickly period in question, owing to deficiencies in the reports during the illness of the successive medical officers, and the space and time it would occupy minutely to analyse those in my possession. For some months after the capture of the Island, the Marines composing the garrisons enjoyed a very fair degree of health; but from the beginning of July, (the usual commencement of the sickly season there,) after heavy rains succeeded by intense heat, fever became daily more frequent in occurrence, and aggravated in character. Upon my arrival on the 29th of the same month, I found the disease had made such progress as caused me to entertain the most painful apprehensions for the fate of the garrison. It

* See Dr. Fergusson's paper in the 8th vol. *Med. Chir. Transactions*, from which the above has been abstracted and condensed.

originally consisted of only 350 men, and there were then 150 on the medical list, 40 of whom were affected with fever, 15 with dysentery, and 75 with ulcers, many of which owing to the sickness of the surgeon, and the accumulation of cases, had attained a considerable degree of malignancy. Of the first disease, many had the yellow or endemic fever of the West Indies, in its most aggravated form, with black vomit; in others, it was of a more protracted character, and with symptoms more resembling those of typhus; while the remainder had remittent or intermittent fevers. On my first view of the sick, and of the low swampy situation of the town of GRAND BOURG, together with the season of the year, I was impressed with the most unfavourable anticipations, and represented to the Commander in Chief, that although I had expected to find much sickness at Mariegalante, I had not been prepared for the conclusion I was then obliged to form—viz. the total reduction of the strength of the garrison in the course of the hurricane months, unless the sickness could be arrested. That my prognostic was but too accurate will appear in the sequel. The closest inspection, on the following day, tended but to confirm and extend this conclusion: my report expressed the grief with which I offered my opinion that the garrison would be shortly incapacitated for any duty; and that the only chance of averting this depended on the adoption of measures of the greatest promptitude and energy.

The first object was to remove, as far as it was possible, both the sick and the well from their unhealthy habitations; rendered still more noxious by the accumulation of disease; and, where this could not be effected, to cleanse and purify the apartments, and to arrange, and separate the sick, &c. The next considerations were the clearing away of whatever was filthy and offensive around them; the employment of negroes for this, and various other fatiguing

and dangerous duties ; the avoiding of exposure to the sun and rain ; a more regular supply of fresh diet, and of wine and spruce beer to the troops, instead of rum ; and lastly, the adoption of every measure which could prevent the facility of intemperance, and excess with noxious new spirit. A more elevated situation was procured for the convalescents, on the hill ; and a large house on the sea-shore to the eastward, and consequently generally to the windward of the swampy grounds, was selected for an hospital ; but the latter, owing to reports of its insalubrity and other difficulties, was never occupied ; though I was decidedly of opinion that the removal of the men, anywhere, was preferable to their remaining in their former situation, which had been replete with disease and death. After making those arrangements, Dr. Mortimer, then surgeon of the flag-ship, who had handsomely volunteered his services, was left in charge of the sick ; and according to his official report, published in the Nineteenth Number of the Medico-Chirurgical Journal, for the first two or three days such was the amendment produced by the measures concerted, that a considerable diminution of disease was calculated upon. But alas ! the remission was but temporary : the men could not be removed beyond the reach of noxious exhalations, emanating in all directions from the low swampy ground covered with rank vegetation ; the concentration of the marsh miasma ; and the predisposition favoured by apprehension and irregularities, increased daily, and the fever proceeded with augmented power and rapidity, until it had swept off half the garrison. The aspect of the country, Dr. Mortimer observes, “ seems particularly favourable to such exhalations. On viewing it, you almost constantly find hills of easy ascent, intersected by lesser declivities, and these on both sides encompassed by swamps ; so that whether in the interior, or the town, sickness nearly equally obtains.”

The enemy taking advantage of the disabled state of the garrison, attacked the island on the 23rd August, and although in a short time it was re-captured, and reinforced by fresh detachments, the sickness was necessarily much increased by the fatigue, exposure, and irregularities incidental to warfare. Many of the old as well as the new troops were seized with the fatal fever: indeed the worst cases were second attacks, brought on by exposure and excesses, and by the end of September, this ill-fated little garrison had lost by disease 234 men. As a most faithful description of the yellow fever by Dr. Mc. Arthur appears elsewhere, and as Dr. Mortimer's report on the epidemic in question has been inserted in the *Medico-Chirurgical Journal*, as above noticed, I do not propose giving any further account of it here.

The only treatment which appears to have had any effect was that of blood-letting and purgatives, if resorted to sufficiently early; but even these measures were inefficacious unless employed at the very commencement; and after what has been said, it is hardly necessary to add that the power and rapidity of the disease were too often such as to set medical control at defiance; indeed, in its highest grade, there is so little chance and time for the interposition of our art, that it may almost be considered irremediable; and, in some instances, men who complained of head-ache and giddiness in the afternoon, were dead by the next morning.

Dr. Mortimer was taken ill before he had finished his report, and was received on board the flag-ship in a state of extreme danger, from which he with difficulty recovered.—He was succeeded by Mr. Waller, (who like his predecessors suffered much from the unhealthiness of the situation,) and from whose communications chiefly I have extracted the remaining account of disease at Mariegalante. The yellow fever declined towards, and indeed altogether

ceased by the end of September, when the season became rainy; and it was succeeded by cases of a protracted description, extending to the period of twenty days or longer; and though characterized by some peculiar and anomalous appearances, with symptoms much resembling those of typhus. During the months of October and November, the weather was wet and squally; and there was comparatively but little fever, with the exception of quotidian intermittents, which were by no means severe, and yielded readily to the moderate use of bark. In December, the tertian became the prevalent type, but early in this month intermittent paroxysms occurred of an alarming character, and of such an intensity, that in some cases, after one or more attacks the patient was carried off by coma and convulsions. In this way seven men died within twenty-four hours; and some even in a much shorter period, so as at first to induce a suspicion of poison. The symptoms may in some have been partly attributable to their having taken a large quantity of rum, with the view of preventing the ague; but they also occurred in others who had not tried this pernicious experiment. In one man who died in about two hours, a green sediment, supposed at first to be some poisonous vegetable, was found in the stomach. In others who were opened, however, no such matter was discovered; but only a bilious looking fluid, similar to what was ejected by many, but not by all before death. In almost every dissection a large quantity of this fluid was found in the stomach, dyeing every thing it touched of a very deep yellow colour—very turbid, saponaceous, adhering to the sides of the vessel, with an odour of ammonia so strong and pungent, as to excite the olfactory nerves, and appearing to be particularly acrid; but not at all resembling the matter with the green sediment abovementioned, nor the black vomit of yellow fever, nor even the yellow fluid which is first thrown up in that disease. The

action of this fluid on the nerves of the stomach seemed to be the cause of the comatose symptoms which came on, soon after the invasion of the paroxysm, or at the commencement of the hot stage; as, whenever an emetic was previously given, a considerable quantity of it was brought up; but the remedy seemed also to increase the secretion of it; for as much would be ejected in the course of the succeeding day as had been discharged by the emetic.—In the greater number, the comatose symptoms did not appear till after the patient had sustained two or three paroxysms: many, however, died in the first paroxysm, when the coma did appear, but more in the second paroxysm. To this account of the severity of the disease, I can well give credit, from the cases which fell under my own observation, while at Mariegalante. In one instance I recollect to have seen a man in whom, not only, as mentioned by Senac, the hot and sweating stages occurred together, but all the three stages seemed to be concentrated at once; for while his teeth were chattering and his body shivering from the sensation of extreme cold, his skin felt excessively hot to the touch, and large drops of perspiration were standing on his face and breast.* When the disease was of the tertian type, Mr. Waller observes that the symptoms lasted about thirty-six hours, or until about two o'clock in the morning of the day after the attack; when of the quotidian type the duration was about eighteen hours, and somewhat milder, but the intermissions being only six hours were less complete than in the tertian paroxysms. In the latter part of the paroxysm the pulse and skin sunk remarkably low, as in the fever about to be described; but they rose again during the apyrexia,

* Besides Senac, Cleghorn, Stork, Pringle, Frank, Burserius, and various other authors adduce instances where the order of the paroxysm was deranged, or some of the stages wanting, and of various anomalous appearances in intermittents.

nearly to the natural standard, and the patient then complained chiefly of debility. In every instance where the patient survived the second shock, he recovered ultimately, but seldom without having had six or seven paroxysms. In this disease, denominated by Mr. Waller, "*the comatose intermittent*," his practice was to give an emetic, an hour before the accession of the attack, which appeared of considerable service in mitigating it: a blister was applied to the head, and sometimes between the shoulders, and the bowels were kept very open with calomel. His principal reliance, however, was on mercurial frictions repeated every hour; and by this remedy he thinks many lives were saved, though in one instance only was ptyalism the consequence of it. When the paroxysms ceased, it was discontinued; and the bark was substituted. The patients continued long in a state of convalescence; and frequently showed symptoms of diseased spleen. Towards the end of November the northerly winds set in; vast quantities of rain fell during the night; and soon afterwards, that is, early in December, fever became prevalent. This fever occurred at the same period, and in some respects bore a strong similitude to the aggravated intermittent above described; but it was of a different type, and appeared in duration and symptoms to be intermediate between yellow fever and typhus. As this fever was characterized by the supervention of extraordinary symptoms, viz. coma, reduction of temperature, and periodical vomiting, I shall give a more particular account of it, as it is described, though more summarily than in the minute, and I have every reason to suppose, faithful report of Mr. Waller.

Description of the Fever.—The patient complains of being taken ill in the evening; but, upon more minute inquiry, it is generally found that a slight head-ache was felt in the morning, with a sense of lassitude and

pain in the limbs ; which symptoms were relieved at dinner, but returned, in an increased degree, about sun-set. Slight rigours then occur, and are often felt for some time after the heat has accumulated on the surface of the body ; they generally continue about an hour, when the temperature becomes steady ; though at a lower point than is usual in the commencement of yellow fever, and considerable thirst and anxiety succeed, while the face and general surface become flushed ; and the blood-vessels of the eye turgid. The pulse is now full, firm, and frequent ; but the skin, though hot, is seldom without some degree of moisture and softness. Perspiration usually comes on early, and continues free and general, during the remainder of the paroxysm, which ceases about two or three hours before daylight. The patient then falls asleep for some hours, and awakes refreshed, and with a considerable remission of all the febrile symptoms ; the pulse is now less full ; but still frequent, and often irregular ; and the tongue, which was merely white before, is found thickly coated with mucus, whitish round the edges, but very foul and brown in the middle. The patient complains now only of debility, and a dull heavy sensation of the head increased on motion, and shows a propensity to sleep. The apyrexia continues till about noon, when the same febrile symptoms recur, but increased in violence and duration. The remission next morning is less complete, and the exacerbation comes on earlier. In general there is no third remission ; the fever becomes continued and is early accompanied by great irritability of stomach, beginning with vomiting of bilious matter, and afterwards of every thing that is taken, with very distressing retching, uneasiness and pain when it is empty. The dull heavy pain in the forehead, with vertigo on motion, is always complained of, which, with the pains of the limbs, generally continues through the disease. The bowels are for the

most part relaxed, sometimes very loose, and the stools watery. The patient most frequently continues in this state four or five days, when a new train of symptoms appears, which give the distinguishing character to this fever; sometimes, however, they appear earlier, at others not until signs of convalescence have occurred. The first symptom is a remarkable degree of stupor; the patient displays the greatest indifference to every thing around him; is with difficulty aroused to answer questions, or to take any thing; and seems much disconcerted at having been disturbed. The pulse, which was before tolerably full and firm, sinks rapidly, and throbs with a quick unequal motion under the finger; sometimes it is scarcely perceptible, and not unfrequently it cannot be felt at the wrist at all. The heat of the surface too, generally subsides, but in this stage it is very variable, though there is reason to believe that if the patient were left to himself he would become quite cold; indeed this coldness of the skin is very remarkable in a great number of cases; and in some appears to be beyond what is felt in the living body under any circumstances; yet the patient does not appear to feel any uneasiness from it. With this extraordinary reduction of temperature, the skin is not anserated, but cold and clammy; and it sometimes continues for several days. The tongue is now found to be dry and hard, and the teeth and lips become covered with a dark-coloured fur. The patient appears to sleep much during the day, or rather he lies in a kind of stupor without sleeping, but at night is, for the most part, delirious. He now seldom complains of pain, or only in the region of the stomach, where it is sometimes very severe. The vomiting, at this period, often subsides; but frequently also it comes on every day about the same time, and is attended with very painful spasmodic contractions of the stomach. This periodical vomiting observes its periods

with great regularity; is a very untractable symptom, and little susceptible of alleviation, by any remedy that has been tried. The vertigo is also exceedingly distressing, and increases so much, in an erect posture, that the patient immediately falls down; and even when recumbent he complains of the giddiness or a very unpleasant sensation in the head. It sometimes continues after the other symptoms have disappeared, and is always extremely tenacious. The symptoms just enumerated continue three, four, or five days; and then gradually subside. But this, though the most favourable, is not the most frequent termination; it oftener happens that the stupor increases to a state of complete coma, or accompanied by muttering delirium, subsultus tendinum, and involuntary discharges. The pulse sinks until it can be no longer felt any where; the whole body becomes cold and cadaverous; and, in some cases, of a deep yellow colour, with no other signs of life than a feeble respiration. Sometimes, at uncertain intervals, the pulse and heat rise, and the patient becomes anxious and restless for two or three hours; then falls again into the former state. But these changes may be effected by the remedies employed, as it is more than probable that they would not so often appear if the patient were left to himself. In this stage, death very frequently happens; but however bad the patient may be, when the formidable symptoms continue above forty-eight hours, it affords a strong presumption that he will recover; and this sometimes has taken place after he has lain in this state for four days. In such instances, when the system emerges from torpidity, the coma first disappears by degrees, and the pulse gradually rises; but the patients continue for a long time in a state of excessive debility, and not unfrequently fall victims to second attacks, or to dysentery. This disease first attacked many of those who had suffered from concentrated fever in

July and August ; its average duration is twelve days, when it terminates in a quotidian intermittent, convalescence, or death.

It may appear but little in favour of the plan of treatment, to state that out of sixty-one seized with this fever, in December, half of them died ; yet when those very formidable symptoms are taken into consideration, it is but fair to infer that remedial measures were not only employed with much advantage in the early, but also in the ulterior stages of the disease, from there being time to put them in practice, according to the existing indications. In the early period of the disease, Mr. Waller observes, it was always considered necessary to lessen the excitement by bleeding, purgatives, and the other parts of the antiphlogistic regimen. But as this stage of excessive excitement was in some cases of much shorter duration than in others, it frequently happened that the patient did not complain sufficiently early to receive much benefit from depletion, or even to bear any abduction of blood. Indeed symptoms of exhaustion sometimes appeared even in the first paroxysm, and in a number of cases, no remission supervened ; but whenever it was authorized, the lancet was invariably and freely used in the first stage, and always with advantage ; in every instance, the bowels were well evacuated by purgatives, and by large and frequent doses of calomel. Emetics, he says, were frequently tried, at first, but not with so good an effect as was expected from them ; and but a very short relief from the nausea was experienced after their use, when this symptom existed, in a considerable degree, in the first stage. Upon this point I shall wave any remarks, as occasionally they may have been useful in the modified disease under consideration ; but in the inflammatory and rapid yellow fever, I am of opinion that the exhibition of emetics, or of antimonial or other nauseating medicines, cannot be too strongly depre-

cated. In the present case, it was only in the first attack, or during the exacerbation, that the patient could bear any evacuation, except by the bowels, which were always kept very open, so long as the pulse was at all full, or retained any firmness; but, when the stupor supervened, he could no longer bear any debilitating process. To allay the gastric irritability, blisters, mercurial frictions, effervescing draughts, small pods of capsicum, &c. were employed, but generally with very little effect. The best remedy seemed to be a grain of opium in a pill, repeated according to the vomiting; but even this was often rejected. So soon as stupor or coma appeared, stimulants were resorted to; blisters to the head, wine, camphor, ammonia, and mercurial frictions; and, in the low state above described, there is no doubt that the friction itself, as well as the remedy, was of service. The delirium was generally immediately relieved by blistering the head. The formidable degree of coma, Mr. Waller observes, mostly came on in the morning early; but he was unable to ascertain whether it was preceded by any peculiar sensation, by which its approach could be certainly known. The prognosis was unfavourable in proportion to the intensity of coma, reduction of heat, and gastric irritability; little dependence could be placed on the circulation. The danger was great when the patient lay in a state of reverie; much greater when there was delirium in the day time, than when in the night. In the comatose affection, he speaks in the most favourable terms of mercurial frictions, and adduces their success in some cases considered desperate, when the patient had been lying in this lethargic state for four, five, or more days, with the pulse, for many hours, imperceptible, and the remarkable coldness of skin above described. These frictions required to be frequently and perseveringly repeated; and latterly he was in the habit of rubbing in a drachm or two

drachms of the strong ointment every hour; which method seemed preferable to any other. To his opinion of the value of mercury in protracted or congestive cases, after the active stages of fever are past, and particularly to its efficacy in visceral obstructions and derangements which are the sequel of certain fevers, I perfectly subscribe. In many such cases, it is not only a most valuable resource, at a period when we have no other indication to pursue, but also, perhaps, where no other remedy would be successful; but of its inutility, except as a purgative, where there is *high febrile and inflammatory action*, as in the early stage of concentrated yellow fever, I am fully convinced; and trust I need not here deprecate the wasting of those precious moments, when only the disease can be controlled, in fruitless attempts to institute the mercurial action. With respect to the combination of this with the depletory plan of treatment, I am inclined to think that the mercury has often enjoyed a larger share of the credit than it has been entitled to; because in many such cases, it has been indebted for the power of exerting its specific action, to the depletion, which, at the same time, has been employed. When we can command a warm bath, in cases like those above, I need not say how much it would contribute to the object in view: it is to be regretted that there does not appear to have been an opportunity of ascertaining the actual temperature of the skin by the thermometer. With respect to the causes of this fever, Mr. Waller does not offer any decided opinion. It was, at first, attributed to the northerly wind wafting a very offensive odour from the burying ground; owing to the hasty and imperfect inhumation of the bodies, which was accordingly remedied. The disease certainly began to prevail after the northerly winds set in; but it is unnecessary to add any ætiological observations after what

has been said of the abundant sources of deleterious exhalations at Mariegalante.

Account of the Causus ; or, Yellow Fever of the West Indies. By Dr. Mc. ARTHUR, F. L. S. Licentiate of the Royal College of Physicians of London, and late Physician to the Naval Hospital at Deal.

SEC. V.—The following concise, but animated description of the fatal Western Endemic was written in 1809, by Dr. Mc. Arthur, late physician to the Royal Hospital, Deal ; and as he had the superintendence of a public hospital nearly six years, at Barbadoes, in the West Indies, with the most extensive field for observation, this document will be found highly interesting and valuable.

The endemic fever, commonly called the yellow fever, certainly excites the first interest, both on account of the mortality which attends it, and the discrepancy among professional men respecting its nature and treatment. The inhabitants of the West India islands, are subject to various fevers of the simple continued, catarrhal, and remittent kind. These attack indiscriminately the native, or the seasoned European, and are as mild as fevers of a similar type in Europe. But the fatal fever, of which I am about to give some account, for the most part attacks persons from Europe, within the first *year and a half* after their arrival in the country, and more particularly seamen and soldiers.

It generally appears at a certain period of the year, earlier or later, milder or more aggravated, according to the state of the weather during that season. Solitary instances, however, occur at all seasons of the year, when favoured by predisposition, assisted by

strong exciting causes. The natives are not entirely exempt, but to them it rarely proves fatal.

It is certain that all the West India islands have their healthy and unhealthy seasons, varied by the condition of the surface, by being mountainous or flat, woody or cleared, dry or intersected with swamps, &c. Barbadoes is clear of wood, the land is moderately raised above the level of the sea, and every spot is cultivated; there are but few swamps and those are inconsiderable—and some rivulets only occasionally swelled by the rains.

From the middle of January to the beginning of May, the air is temperate and dry. In May the rainy season begins and continues till the end of September. October and November are generally dry, if much rain has fallen in the preceding months. Rain again falls towards the latter end of December, and till the middle of January. Bridgetown and its vicinity are extremely hot from June to November, the thermometer at noon varying from 84 to 90° in the shade.

The parallel of health between the Army and Navy is worthy of notice. The fever for some preceding years has appeared in both about the same time, and attacked men of similar habits; but has in general been more aggravated on shore than at sea, or even on board the ships lying in Carlisle Bay.

This fever is usually ushered in by the sensations which precedes other fevers; such as lassitude, stiffness, and pain of the back, loins, and extremities; generally accompanied by some degree of coldness. These are soon succeeded by a severe pain of the head; a sense of fullness of the eye-balls; intolerance of light; skin dry, and imparting a burning heat to the hand; pulse full and quick; tongue covered with a whitish mucus, but often not materially altered from the state of health; bowels bound. I may here remark, that the actual degree of heat, as indicated by the

thermometer, is not proportionate to the intensity communicated to the touch. It generally varied between 99 and 102°, very seldom exceeding 103°; yet the skin imparted a burning caustic sensation to the hand at these times.

If the patient has been attacked in the night, he awakes with oppressive heat, head-ache, and the other symptoms of fever, the sensation of cold having passed unnoticed. At other times, after fatiguing exercise in the sun, and sometimes after a hearty meal, the violent head-ache, and other symptoms of the fever, are ushered in by an instant loss of muscular power, and immediate depression of nervous energy. The patient, as if he were stunned by a blow, falls down, his eyes swimming in tears. In those cases, delirium is an early symptom. In a few hours, the pain of the loins increases, and, in aggravated cases, stretches forward towards the umbilicus; the countenance is flushed; the white of the eye as if finely injected by blood-vessels, the albuginea appearing through the interstices of the net-work of vessels, of a peculiar blue, shining, cartilaginous whiteness.

During the first twelve hours, the patient is not particularly restless, enjoys some sleep, and, when covered by the bed-clothes, has partial perspirations on his face, neck, and breast.

About the end of this period, there is a great exacerbation of the fever; he becomes restless; the heat and dryness of the skin increase; there is much pain of the eyes and frontal sinuses; the pain of the thighs and legs is augmented; thirst is increased, with a sensation of pressure about the region of the stomach. Nausea and vomiting occur towards the end of the first twenty-four hours. If the fever has not been arrested within thirty-six hours from its commencement, the patient is in imminent danger, and all the symptoms are aggravated; the pulse is strong and full, and pulsation of the carotids appears distinct on each

side of the neck. The skin continues hot and dry; the thirst is increased; there is much anxiety, the patient continually shifting his posture; the urine becomes high-coloured; all his uneasiness is referred to his head and loins. A sensation of pain is felt about the umbilicus, when pressed upon; the white of the eye now appears of a dirty concentrated yellow colour, and apparently thickened, so as to form a ring round the margin of the cornea. The blood-vessels of the eye appear more enlarged and tortuous; knees drawn upwards to the abdomen; frequent vomiting, with much straining; mucus, and his common drink only, being ejected. Delirium comes on about the end of the second day. There is now a dryness, or slight sensation of soreness of the throat when swallowing; and about this time, an urgent sensation of hunger frequently comes on, and a remarkable want of power in the lower extremities, resembling partial paralysis of the limbs. About this time, also, the pain of the loins is so severe, that the patient expresses himself as if his "back was broken."

The third day, or stage, begins by apparent amelioration of all the bad symptoms, the vomiting and thirst excepted. The matter ejected has small, membranaceous looking floculi floating in it, resembling the crust washed from a port-wine bottle. The thirst is now urgent, and there is an incessant demand for cold water, which is almost immediately rejected by the stomach. The heat of the skin is reduced; the pulse sinks to, or below its natural standard; the patient, for an hour or two, expresses himself to be greatly relieved, and at this time, a person unacquainted with the nature of the disease would have hopes of his recovery. This state, however, is of short duration, and the delusion soon vanishes.—The delirium increases; the matter ejected from the stomach becomes black as coffee-grounds and is somewhat viscid. Diarrhœa comes on; first green, then

black, like the matter vomited. The patient often complains of being unable to pass his stools, from a want of power in the abdominal muscles. There is an acrid, burning sensation of the stomach, and soreness of the throat, extending along the whole course of the œsophagus, in attempting to swallow; eyes, as if suffused with blood; skin a dirty yellow; parts round the neck, and places pressed upon in bed, of a livid colour. More hæmorrhage or less takes place from the nose, mouth, and anus, and a deposition of blood from the urine. The delirium becomes violent; the body as if it were writhed with pain, the knees incessantly drawn up to the belly. The patient seizes, with convulsive grasp, his cradle, or any thing within his reach, and prefers the hard floor to his bed. The pulse now sinks; respiration becomes laborious; the countenance collapsed—the lustre of the eye gone.—For some hours, he lies in a state of insensibility before death; at other times, expires after some convulsive exertion, or ineffectual effort to vomit. The tongue is sometimes but little altered during the course of the fever; and if loaded in the early stages, it often becomes clean and of a vivid red before death.

Such is the regular succession of symptoms which characterize this fever, but of longer or shorter duration, according to the violence of the disease, or strength of the powers of life to resist it.

In weakly habits, the vascular action at the beginning is less marked; and in these cases, the fever is generally more protracted, and the patient expires unaffected by the laborious respiration, and convulsive motions, which attend the last struggles of life, in the more violent degrees of this endemic. Very often the patient retains his senses till within a few minutes of his death; and sometimes will predict, with considerable precision, the hour of his dissolution.

In the early stages of the worst cases of this fever, there is much anxiety in the countenance of the patient, who expresses a despair of recovery. This fear does not appear to proceed from any *natural* timidity, but seems rather a symptom of the disease. In the last stage, there is as much *resignation* to his fate, as there was apprehension at the beginning. The fever of the Amelia in 1804, and of the Northumberland and Atlas in 1805, terminated fatally from the second day to the fourth day. The fevers of 1807 and 1808, extended from the third day to the fifth. I have never noticed a remission during the whole course of the fever. Several cases of remittent fever under my care terminated in the endemic fever.

A certain number of those attacked by this fever, if prompt measures to subdue it had been employed, recovered from its first stage. They exhibited evident signs of amendment within the first twenty-four, or at furthest thirty-six hours, from its first attack. Also a considerable proportion recovered from the second stage; that is to say, previously to black vomiting unequivocally appearing. But I have only known thirteen cases, in above five years, to have recovered from the last stage. Some of these were afterwards invalided, in consequence of dyspeptic complaints, and generally disordered state of the stomach, and other abdominal viscera.

In these cases, the stomach gradually became retentive; the eyes and skin became of a more vivid yellow; they had refreshing sleep, but continued extremely weak and languid for a long time. The oozing of blood from the fauces and gums also continued for some days; and the deposition of blood in the urine remained longest; this excretion being always the last to return to its natural healthy condition.

Pain of the back, early stretching round to the navel—soreness in the throat and œsophagus—heat

and acrid sensation in the stomach—urgent thirst—hunger—want of power, resembling paralysis of the limbs—violent delirium—despondency—enlargement of the blood-vessels, and a red-yellow colour of the white of the eye, either singly or collectively, indicate extreme danger; and when the black vomit has appeared, scarcely a hope remains!

The following were the appearances after death, [four cases excepted,] in above an hundred bodies which I have inspected.

Omentum little altered.—Peritoneal coat of the stomach occasionally marked, in a slight degree, by inflammation.—The stomach contained more or less of a viscid, black fluid, such as was ejected by vomiting.—Irregular spots, patches, and streaks of the internal surface of the stomach, in a state of inflammation, gangrene, or sphacelus.—Sometimes large portions of the villous coat destroyed, as if corroded by some acrid matter.—The small intestines and coecum inflated with air, and often containing lumbrici, and a small quantity of dark-coloured fœces, were inflamed, and in many places approaching to the state of gangrene. No marks of inflammation in the colon, but it was singularly contracted.—Lower part of the rectum frequently excoriated.—Concave surface of the liver occasionally inflamed.—Gall-bladder turgid with ropy bile; and, in some instances, its coats were one-fourth of an inch in thickness.—Other viscera of the abdomen little changed.—In the thorax, the posterior part of the superior lobules of the lungs, generally were very turgid with blood. Internal surface of the œsophagus, throughout its whole extent inflamed.

In ten cases of a peculiarly aggravated degree of fever, where much delirium had been present, I opened the head. The blood-vessels, in some instances, seemed more turgid with blood than usual. In two cases, there were about two ounces of serum effused into the lateral ventricles; but in five cases the brain did not exhibit any marked appearance of disease.

The black matter found in the stomach did not resemble bile; but evidently was blood poured into the stomach from the relaxed vessels, or excoriated and gangrenous surfaces, altered by the vitiated secretion of the gastric fluids.*

Europeans, within the first eighteen months after their arrival in the country, being almost exclusively obnoxious to the yellow fever, it is natural to suppose, that there is something in the European constitution, favourable to the morbid motions which constitute this fever; and that this peculiar habit consists in a disposition to take on inflammatory action. Persons seasoned to the climate, and even natives, by sudden alterations in their mode of life, sometimes acquire this predisposition. Young people born in the West Indies, and educated in England, and persons having resided some years in England, after they had passed the greatest part of their lives between the tropics, are liable to this fever on their return to the West Indies.

This disposition is excited into action by a variety of causes; the chief of which are—intemperance; excessive fatigue in the sun; perspiration checked, by being exposed to a current of air, or sleeping exposed to the dews; costiveness, &c.—In fact, whatever becomes an exciting cause of fever in any country, is equally so in this; but unfortunately it is not the same fever that is induced.

It has been observed, and very frequently urged by the *bon vivant*, as an excuse for his mode of life, that men who live in the most temperate manner, are as liable to fever, if not more so, than those who follow the opposite extreme.—There is an appearance of truth in this remark. Often the temperate and

* This was written two years previous to Dr. Bancroft's publication. It very nearly agrees with his opinion, and those of the American practitioners, noticed in the first section.

sober are seized with this fever, under circumstances where the drunkard escapes.

A stranger, on his arrival in this country, unless possessed of more than ordinary resolution, is assailed by so many temptations, that he has not the power to follow the plan he may have laid down for his own regulations. He commits an *occasional* excess, and next morning awakes in a high fever; while the man accustomed to his "*mosquito dose*," probably feels no uneasiness, or if he has a slight head-ache from his last night's debauch, flies for relief to his hot punch or sangaree. The more temperate and regular a man has lived, any deviation will become, in a proportionate degree, a stronger exciting cause of fever. But if the drunkard and the sober man should be attacked with fever, the former has by no means an equal chance of recovery with the latter.

Contagion as a source of this fever is entirely rejected by those professional men who have the greatest opportunity of information, now resident in the West Indies. No case occurred where the fever could be traced to a contagious source. No place could be better adapted to spread contagion than the building appropriated to the sick in Bridgetown, before the occupation of the excellent new hospital, in May, 1807. The patients and their bedding were carried to it through the town by any hired labourers: they were often obliged to take shelter in houses by the way; and this to the credit of the poor inhabitants, was never refused them. From want of means of separation, fevers and other complaints were huddled together in the same ward. The officers and nurses lodged and visited in every part of the town; and lodgings were procured for sick officers wherever there was room in the town, when they were required, without hesitation. Yet, notwithstanding all this unrestricted communication, no instance occurred where

fever could be traced to a contagious source: and surely, if it were contagious, it would not be so generally confined to men recently arrived in the country.

In the very first stage of this fever, it would probably be difficult to distinguish it from the other continued fevers of the country. Its violence is one criterion by which we might form a judgment. We must also look to the particular circumstances of the person attacked.—If he has been but a short time from Europe;—if he has been taken ill after a debauch—fatigue—or unusual exposure to the sun, or to a partial current of air, or after sleeping in the night air, there is much reason to apprehend yellow fever; more particularly if the eyes be inflamed, and the pain of the loins stretches forward to the navel, with soreness of the throat—heat and acrid sensation in the stomach; a feeling of pressure there, and urgent desire for cold drink. These, and the other symptoms already described, will indicate the nature and the danger of the disease.

In the early part of my superintendance, I gave the fairest trial to every mode of practice recommended by eminent practitioners, including the mercurial plan of treatment.—But in no instance in the worst cases that terminated in death, however protracted the fever might have been, could the mouth be affected; while in the milder cases, where the fever subsided in 36 or 48 hours, the mercurial action became manifest within that period. In some protracted cases, ptyalism did not appear for several days after the mercury had been discontinued—and in others, after the gums were affected, where the patients had a relapse, the mercurial action immediately ceased, or was suspended. But the subinuriate of mercury I continued to employ with much advantage as a purgative, but in smaller doses, of course, than when I attempted to excite salivation.

Bleeding largely, in the early stage of the fever,

has been found of the most eminent service. When employed after the first stage of the fever had passed by, it did injury, and certainly hurried on dissolution. The following plan is that which has been pursued at this hospital, for several years; it is that which has been practiced on this station, and has been attended, (would I could say with uniformly the happiest effect!) with at least superior success to any other.

From twelve to twenty-four ounces of blood and upwards are drawn from the arm, as soon after the accession of the fever as possible. The blood should be drawn until derangement of the vascular action has taken place, by the quantity of blood extracted; indicated by approaching syncope, nausea, and vomiting. Should fainting come on, from mental emotion, such as the dread of the lancet, sight of the blood, &c. the bleeding is to be continued after the patient has revived, until a quantity proportioned to the strength is drawn off. Six grains of calomel, and double that quantity of cathartic extract, are to be immediately given; and if this medicine does not operate in three hours, it is to be repeated. At the end of six hours, if the purgative has not yet had effect, it is to be assisted by an enema; and either an ounce and a half of sulphate of magnesia or soda, or half a drachm of jalap, with an equal quantity of supertartrate of potass, is to be given.

In eight hours after the patient has been bled, six or eight full, copious evacuations should be procured.

During this time, if the skin be hot and dry, the cold affusion is to be employed every two hours. Partial perspiration, in the early stage of the fever, should not deter from its use. The greater the force with which the water is applied, the more benefit is to be derived from it. When there is much pain of the head, the hair is to be shaved off. Thus the

treatment, during the first twenty-four or thirty-six hours, consists in one full, large bleeding—purgatives, so as to procure several copious alvine evacuations—the cold affusion*—shaving the head; and the liberal use of barley water, or any other weak drink.

Under this plan, fifty patients out of one hundred, attacked by the genuine endemic fever, will show evident signs of amendment within the above-mentioned period. A general perspiration, not profuse, will break out; the heat of the skin will be reduced; head-ache and pain of the thighs and legs will be abated; the red vessels in the white of the eye will disappear; the thirst will be lessened; and in short, all the feelings of the patient will become more agreeable. From this state they recover with extraordinary rapidity. In one week they are restored to perfect health.

If this favourable change does not take place within the period alluded to, there is much danger. The patient becomes restless; the sensation of pain is more acute; delirium, vomiting and other bad symptoms succeed. In this stage, the bowels are to be kept loose—two or three stools are to be procured every twenty-four hours, by calomel, given in four grain doses, three or four times a-day, as the state of the bowels may indicate. The cold affusion is to be continued, lessening the force with which the water is applied, as the vascular action and heat diminish. The warm bath will also be advisable in certain cases, and removing the irritation of heat by frequently sponging the palms of the hands, arms, and other parts with lime juice, spirit, &c. where a cold affusion cannot be employed. If delirium and vomiting are present, blisters are to be applied to the head

* The vapour bath, now coming into use at the naval hospitals abroad, bids fair to prove a powerful auxiliary in soliciting the blood to the surface, and thus relieving the internal organs from the effects of CONGESTION.

and nape of the neck. Before the heat is reduced, and the vascular action brought down to its natural standard, stimulants are employed; such as wine, at first in small quantities, gradually increasing it; capsicum, in the form of pills. If the patient has been much addicted to spirits, toddy in lieu of wine is to be allowed; but the stimulant from which I have observed the greatest benefit, is the carbonate of ammonia, in doses of six or eight grains every two hours, with small doses of nitrous æther, diluted with water. When vomiting is urgent, the patients are to be restrained from drinking much; and when the stomach is empty, more benefit is derived from two table-spoonsful of arrow-root every half hour, than from any medicine I have known. Sulphuric æther, and even ardent spirits, to restrain vomiting, as the heat and vascular motion subside, have been taken with partial relief.

This state may continue for two days, or even longer, before there is any relief. The first favourable symptom is usually a refreshing sleep, and the absence of delirium. A warm and moderate perspiration covers the surface; and if the skin and eyes have been yellow, the colour becomes more bright.

Convalescence from this stage of fever is much more slow than from the first. Much attention to the state of the bowels, and the liberal use of the decoction of bark, with vitriolic acid, if there be much oozing of blood from the gums and fauces, are necessary. From that stage in which the black vomit is the prominent symptom, few—very few recover.—Dark-coloured fluids, however, have been often taken for black vomit, where the latter did not exist, and thus nurses, and even medical men, have been deceived. All the cases that recovered at this hospital were certainly unexpected.—This dreadful symptom had continued in all of them above twelve hours; oozings of blood from various parts, stools as black

as ink, &c. were present. The first sign of amendment was the stomach becoming retentive, and the enjoyment of a few hours sleep. The yellow colour of the eyes and skin became daily brighter, till at last the patient had the most perfect jaundiced look ; the colour of the stools keeping pace with that of the eyes and skin. The stimulating plan of treatment, after full and copious evacuations in the earliest stage of the disease, was gradually begun with these patients long before the vascular action had been reduced to its natural standard. Wine frequently, and in small quantities—the carbonate of ammonia—capsicum, with arrow-root, were assiduously administered ; and whenever the appetite of the patient craved for brisk porter, spruce beer, &c. they were never denied ; but these and other drinks were given in small quantities at a time, as larger caused instant vomiting.

Relapses from this fever frequently terminate fatally.—Want of appetite, and sensation of fulness at the stomach, usually precede the common train of symptoms. In these cases, I found an emetic give instantaneous relief. The patient generally vomits a large quantity of æruginous-coloured matter, and the evacuation is attended by immediate ease: two or three drachms of the tartarised antimonial wine, (Edin. Phar.) are generally sufficient for the purpose. In the usual practice of the hospital, emetics are omitted: they delay the exhibition of brisk purgatives, which are required to move the bowels in this fever. But there is one form of the endemic commencing with diarrhœa, and sometimes dysenteric symptoms, in which emetics are employed with advantage. When the fever, however, commences in this way, it is less dangerous, though more protracted, than where costiveness and torpidity of the bowels attend.*

* “The most favourable cases of the yellow fever, are those in which a bilious diarrhœa comes on ; while the most fatal are those

It has been said, that persons who have once had the yellow fever are not again liable to be attacked. This is not the fact: I have more than once had a man under my care with yellow fever, who afterwards died of another attack of the same disease.

In this, as in other diseases, anomalous symptoms will occasionally occur, requiring slight modifications of treatment; but these can be only learnt at the bedside. On this account, I forbear to enumerate laudanum, æther, ginger tea, effervescing draughts, champagne, &c. which in high practice are sometimes prescribed.

On the Inflammatory Endemic of New Comers to the West Indies from temperate Climates. By **NODES DICKINSON, Esq.** *Member of the Royal College of Surgeons, &c.**

SEC. VI.—Introduction.—This disease is the effect of sudden change of climate upon new comers of a sanguine temperament; and is commonly designated the *Yellow Fever*, from the occurrence of an incidental symptom.

In a few weeks the stranger is brought from a climate in which the atmospheric temperature, at the time of his departure is, perhaps, under 30° to 90° of

“in which the bowels are so torpid as to be insensible to any stimulus, either from their own contents or from medicine.”—*Blanc, 3d ed. p. 450.*

* The following valuable observations have been kindly drawn up by my able and esteemed friend, Mr. Dickinson of this Metropolis, whose ample experience, as a Staff Surgeon in the West Indies, enabled him to present to the public an important work on the inflammatory Endemic in question, of which the present paper may be considered a very concentrated Analysis. It will be observed that Mr. D. confines himself to that form of the fever which attacks new comers, and is produced by Insolation.

Fahrenheit in the shade; and 130° when exposed to the direct action of the solar rays.

The inflammatory endemic being, exclusively, incidental to strangers from temperate regions, will be found to occur with a prevalency proportioned to their numbers: sporadically when these are few, and, in appearance, epidemically when many are introduced at the same time.

When it happens in a mild degree it is appropriately called a "*seasoning*." The reduction of the system by the evacuations employed for its removal is very frequently preventive of a future seizure.

The probability of an attack of the inflammatory endemic very much depends upon the degree of inflammatory diathesis. The causes which produce a severe affection in young and plethoric strangers, seldom affect the older residents. Natives of the country and Africans escape its seizure. Women and children, the aged and weakly, are less liable than the robust and strong.

The inflammatory endemic, which, in its mildest form, has been regarded a "*sporadic febricula*" is under a severer aspect, when attended by a yellowness of the skin and black vomiting, often erroneously considered an infectious epidemic of malignant character.

It is a disease in which there is from the beginning a state of universally increased excitement, with a direct tendency to general inflammation, soon accompanied by the actual inflammation of certain organs. Very much of the mischief ensues from a want of moderating the first excitement. If this be subdued there is little to apprehend from consequent debility. The patient will recover, and with the advantage of a system prepared for the climate in future, in so far as the inflammatory endemic is concerned.

Producing Causes and Prevention.—The causes of the inflammatory endemic are predisponent and ex-

citing. The *predisposition* consists in an inflammatory diathesis—an aptitude to diseases of general increased excitement: this appears sufficiently manifest by a consideration of the subjects already stated as exclusively liable to its attacks. The exciting cause is an exposure to solar radiation while unaccustomed to its influence, and unprepared to resist the force of its impression by the adoption of preventive measures. The effect of heat is liable to augmentation if accompanied by violent exercise, by full living, and intoxication.

Whatever tends to diminish the predisposition forms the ground-work of prevention: it is founded in reason and proved by experience. The detail consists in bleeding, purging, cold bathing, abstinence from fermented liquors, and a spare diet of animal food. These should be employed, agreeably to the state of individual predisposition, until the inflammatory diathesis is reduced. If the immediate exciting cause be diminished in its power, by the new comer repairing at his arrival in the West Indies to an elevated situation, where the temperature is low, compared with the heat of the maritime towns, his safety will be greatly insured. To avoid, as much as possible, exposure to the direct and powerful radiation of the sun: to use exercise, in moderation only, and to observe an undeviating rule of temperance and sobriety, are to obviate the action of the exciting causes and prevent the disease. Diurnal vicissitudes of temperature should be carefully guarded against by the unseasoned stranger. A dangerous state of excitement is liable to result from the increased susceptibility induced by the sudden application of cold to the surface, when this, although trifling in degree, is immediately succeeded by the stimulation of inordinate heat.

Symptoms and Treatment.—The history of the inflammatory endemic and its general character are

such as the nature of its causes must obviously suggest.

It occurs with different degrees of severity in the ratio of the impression of its exciting causes and individual predisposition. Two cases are seldom precisely alike in this particular. It varies from a "seasoning" or mild synocha to the most formidable seizure.

A slight attack has seldom been recognised to bear strict affinity with the much dreaded "yellow fever." Considered merely a "seasoning," it has rarely been regarded of the same kind, produced by the same causes, and prevented, or removed by the same general means, which are applicable to the more violent disease.

The inflammatory endemic in its severer aspect, and when neglected at the attack, consists of two stages. In the first, there is increased excitement, resulting from an unusual stimulus applied in an excessive degree to a system peculiarly sensible to its impression: it produces a derangement in the functions of some or many viscera. If this goes on, the second stage appears, in which the structure of these viscera is altered to a degree incompatible with the living state.—Thus the disease proceeds from high excitement to irreparable exhaustion, as we shall perceive by attending to the history of its symptoms. In the less severe example there is chilliness at the onset, soon followed by a permanent and universal sense of heat—flushed face—inflamed eyes—head-ache—increased susceptibility to the impressions of light and sound—vertigo—drowsiness—sighing—white tongue—arid fauces—thirst—wandering pains—loss of appetite—costiveness—high-coloured urine—dry skin—nausea—full and frequent pulse;—should these symptoms in a severe degree remain without control, the disease is soon increased to its most aggravated form. The patient is extremely restless, with a continual

desire to alter his position, but without relief. The heat and head-ache are intense—the carotids throb with unusual violence. There is sometimes a furious delirium—tinnitus aurium and even loss of sight. There is, occasionally, a dry cough with pain in the side, and almost invariably a sense of heat, oppression and pain on pressure at the præcordia, accompanied by constant sighing. Vomiting sometimes comes on very early in the attack. There is often great drowsiness but no refreshing sleep. In some cases an acute pain is felt in the right side: and a yellow colour of the skin often supervenes. This yellowness is occasioned by the presence of bile, which is also detected in the urine and serum discharged from blisters. Should the passage of the bile into the intestines spontaneously take place or be procured by the action of purgatives, this jaundiced appearance will, generally, be prevented: nevertheless, in some cases it may possibly arise from a redundant secretion, even when the bilious canals are free: and a bilious vomiting and purging may occur with the yellowness of the skin and carry off the attack. These symptoms proceed with various degrees of violence, and they occupy an uncertain period. Within 12—24—or 36 hours; or, perhaps, after a longer, but indefinite time, an important change takes place. It marks the commencement of the second stage. Many of the most urgent symptoms decline. The pain and heat of surface subside. There is a sense of cold with dampness of the skin. This change at first so much assumes the appearance of febrile remission as to give great hope to the inexperienced practitioner; but it speaks a state of the utmost danger. In some cases the patient sinks, at once, after the subsidence of excitement, apparently destroyed by the general affection, without any previously severe determination of blood to particular organs; and he dies at the moment of hope in his amendment. But more commonly

the catastrophe is not so sudden. With the diminution of heat and pain, the pulse falls—the countenance exhibits great distress—the eye is sunk—the pupil dilated, sometimes delirium continues—at others, there is great insensibility with tendency to coma. Vomiting, occasionally, continues without intermission:—at times, however, the stomach remains tranquil: and this, when there is much cerebral disturbance.

As the disease advances a discolouration of the skin often takes place. It appears in yellow, brown, and livid patches. This discolouration never comes on until the subsidence of the symptoms of excitement, however early in point of time. It occurs with the passive hemorrhagy from various parts: from the nose, corners of the eyes, ears, &c.; and at the same time with the black vomiting. This change of colour appears to arise from ecchymosis proceeding from exhaustion of the *vis vitæ* in the capillary vessels of the surface in consequence of previous inordinate excitement. It is very dissimilar from the bilious yellowness already noticed as an incidental symptom of the first stage of the disease.

The first discharges from the stomach are merely the ingesta; afterwards a large quantity of serous fluid is ejected when little has been drunk. In a more advanced stage of the complaint the material thrown up is ropy and mixed with numerous small shreds, flocculi, or membranaceous films which float in the ejected liquid. These soon acquire a dark brown, purple, or black colour, but do not, at first, communicate much general tint to the fluid in which they are suspended. Afterwards, the matters vomited are more intimately mixed together; and with the addition of dark-coloured blood which is effused into the stomach, vitiated bile, and other morbid secretions, give an appearance in the aggregate of coffee-grounds. There is at this period, usually, a purging of dark-coloured matter resembling tar mixed with black blood.

Sometimes within the first forty hours, at others after a more protracted period, the scene draws toward a close with the ordinary phenomena of approaching dissolution, which accompany the last stages of acute disease in general. There are dilated pupil—strabismus—singultus—subsultus tendinum—coma—deliquium—hæmorrhage from various channels—suppression of urine—low muttering delirium—total insensibility—occasionally violent raving, and an incessant disposition to rise in bed. These are among the last symptoms of an unsubdued attack, and they mark the near approach of death.

An examination *post mortem* exhibits unequivocal vestiges of previous inflammation. In the brain, increased vascularity and a deep redness of the membranes—rupture of the vessels—adhesion of the hemispheres and membranes—coagulable lymph—extravasated blood—serous effusion. In the stomach, a lymphatic film adheres to the surface of the villous coat in different parts; but is easily detached. During the last remains of life it is ejected with the fluid contents of this organ. Numerous dark-coloured spots are interspersed upon the villous coat which present the mouths of vessels from whence there oozes black blood. The same appearances are seen throughout the track of the intestines—the liver is occasionally much diseased: it is livid and overspread with dark-coloured patches—frequently of a deep purple colour throughout its structure—greatly enlarged, and filled with blood.

These are the usual symptoms of the inflammatory endemic, and of its destructive inroads, upon the healthy fabric of the body, supposing it to pursue an uninterrupted course in an example of great severity. These symptoms are, nevertheless, very irregular both in their general appearance, their degrees of violence, their precise order of succession and duration. Thus we find that after a period of violent and

uncontrolled excitement, exhaustion succeeds. The increased action of the heart and augmented heat of the surface subside, healthy secretion is not performed—the blood passes into the capillaries, without undergoing the necessary change in the secreting organs, giving rise to congestions and effusion, and passive hæmorrhage from every outlet.

The consideration of these stages of increased excitement and exhaustion determines the rationale of the treatment; as an attention to the nature of the producing causes afforded the ground of prevention. The curative indication is established upon the inflammatory character of the disease at the attack; and, therefore, comprehends the means of subduing general excitement, and of preventing thereby the determination of blood upon particular organs. The treatment is simple at the commencement of the disease, and is fully announced by the symptoms of that stage. In the first place, every cause of irritation should be removed. These will be obvious to the practitioner as they may present themselves on particular occasions. Their removal is to be effected by the “antiphlogistic regimen,” which should be strictly enjoined.

If, at the moment of attack, the stomach is loaded with food, or over stimulated by strong drink, an emetic should obviate the impression of this exciting cause. After which, we must resort to general bleeding—the warm bath—cold lotions to the head—cool air—cold drink—active purging—blisters—cold ablution when the heat returns—injections of cold seawater. These measures must be used to reduce excitement and prevent the debility liable to result from over exertion generally, and from over distention of particular vessels, causing congestion; while, in the occurrence of determination of blood to the head, stomach, lungs, or to the hepatic region, topical bleeding and blisters must be employed to remove

congestions already formed and allow the weakened vessels to recover their tone. If, however, the exhaustion of the second stage has supervened, the practitioner can administer but feeble aid. Quietude, a cool atmosphere, gentle laxatives, nourishment, and sleep, present the only means of restoration.

In this disease the restorative powers of nature must not be waited for. It does not possess any salutary reaction—any adequate means of curing itself. The chance of recovery is always diminished in a ratio proportioned to the length of time which is suffered to elapse without the employment of decided antiphlogistic measures.

TETANUS.

SEC. VII.—This *opprobrium medicorum*, though an occasional sojourner in all climates, has its principal seat and throne between the tropics. The disease, however, is equally fatal, though not near so frequent in a cold, as in a warm climate. According to my own experience, and that of most of my naval and military friends, the *traumatic* is greatly more dangerous than the *idiopathic* species, though this sentiment does not accord with that of Dr. Morrison, the latest writer on the subject.

The *Symptomatology* of Tetanus is by no means necessary in this place, since it is impossible for the veriest tyro to mistake the disease. Some pathological and therapeutical observations only will here be introduced.

Pathology.—Dr. Morrison, in his recent treatise on Tetanus, asserts that dissection has thrown little if any light on the seat or nature of the disease. But some late papers and investigations would seem to diffuse a ray of light on the obscurity of this patholo-

gical track, and induce us to believe that we have too long neglected the morbid anatomy of the spinal cord, and of the medulla oblongata, in diseases attended with violent spasmodic affections. Dr. Sanders, of Edinburgh, has long laboured in the developement of this dark subject, and not without some success. The harmonious balance, not only of the circulation in itself, but in its relation with the nervous system, has too long been overlooked; but new light is now breaking in upon our minds from the tomb. The *inequilibrium* in the balance of the *excitement*, which exists in almost all diseases, is here evinced, in characters that can hardly fail to be understood. While the class of voluntary muscles is in complete spasm, various organs—more especially the chylo-poetic viscera, are utterly torpid.—This inequilibrium in the balance of the excitement shows itself, even before the developement of spasms, in the torpor and costiveness of the alimentary canal *precursory* of, and cotemporaneous with Tetanus, as was sagaciously remarked by that accurate observer of nature, Dr. Dickson, in the 7th volume of the Medico-chirurgical Transactions.

We must therefore look to the origins of those nerves which supply spasmed muscles, for the immediate seat of the mischief; and there it will be found, without a doubt. Dissections of the base of the brain, medulla oblongata, and medulla spinalis, have not, till lately, been prosecuted with any thing like accuracy.

Dr. Reid has now forcibly drawn the attention of the medical world to this subject, and it will, no doubt, be well investigated. It has long been remarked, indeed, that in Tetanus the natural functions are little affected, and the same may be said of the intellectual functions, and those muscles and organs supplied by the nerves of sense. These considerations naturally lead to the conclusion that the thoracic and

abdominal viscera are not primarily affected, and that the origin of the disease is not in the nervous substance supplying those organs—in short, that the cerebral and ganglionic systems are only drawn in *subsequently*, and that the spinal cord is the original and principal seat of Tetanus.

Case in elucidation, [from Dr. Reid.]—A boy 14 years of age, after receiving a severe bruise in the toes of the right foot, was exposed to the vicissitudes of the weather in the month of February. He was seized four or five days afterwards, with tetanus, and died in thirty-six hours. *Dissection*.—Viscera of the abdomen and thorax perfectly sound, as were all the muscular parts. On opening the spine, *from the back part*, and on raising the nervous mass, (with its dura mater entire,) from the spine, “there appeared a considerable effusion of blood in the cellular tissue, connecting it to the upper lumbar, and lower dorsal vertebræ. A similar effusion occurred also along the bodies of the upper dorsal and two lower cervical vertebræ. On slitting up the dura mater on the anterior surface, the nervous mass appeared highly vascular, and the vessels of every description remarkably tortuous. The only appearance in the nervous substance itself, was a deeper tinge than natural in its cortical and medullary parts.”

From these appearances, corresponding with the investigations of Dr. Sanders, it follows that tetanus is radically an inflammatory disease. But general blood-letting here will not be near so efficacious as local abstractions of blood from the spine—blisters—purgatives—and finally, mercury and opium to equalize the balance of the circulation and excitement. The following observations from Dr. Morrison, the latest writer on tropical tetanus, may be appropriately introduced here.

Dr. Morrison was led to compose his present *Treatise on Tetanus*, from having had considerable

experience in that disease, during an eight years practice in the Colony of Demerara, where it is of frequent occurrence. The land of this part of the South American Continent is low, flat, and marshy, abounding with swamps, and, with the exception of a strip along the banks of the Demerari, is covered with trees of various dimensions, whose roots, for a great part of the year, lie bedded in water. The prevalent diseases are intermittents, fevers, hepatitis, enteritis, rheumatism, dysentery, and, among children, hydrocephalus.

Dr. M. does not look upon Tetanus, even the traumatic form, as so very dangerous a disease, in tropical climates, as authors have represented it. He has witnessed many instances of recovery both from traumatic and idiopathic tetanus, and, strange as it may appear, the instances of cure in the *former* have been nearly as numerous as in the *latter*. In upwards of twenty cases of this disease which he witnessed among negroes, the pulse was, in no instance, accelerated in the manner related by Dr. Parry. He has never known it above 98, whether the termination was favourable or fatal.—The following prognostic passage we shall transcribe.

“When the disease comes on gradually; when for the first three or four days the muscles of the jaws are solely affected, and that perhaps not in any alarming degree; when the abdomen is not preternaturally hard, or the bowels obstinately costive; when the skin is moist and moderately warm, and above all, when the patient enjoys sleep, we may, (by the means hereafter to be spoken of,) entertain strong hopes of an eventual recovery. An increased flow of saliva where mercury has, or has not been used, is always to be regarded as favourable; the less the general air of the countenance is changed, the better. On the other hand, when the attack is violent and sudden; when the muscles of the neck, back, and abdomen are

rigidly contracted ; when the patient complains of a shooting pain from the sternum towards the spine ; when the belly feels hard like a board, and the least pressure thereon produces spasmodic twitching or contractions of the muscles of the neck, jaws, &c. ; or when the same effect is brought about by the presentation of any substance, (solid or fluid, near the mouth, we have much reason to fear a fatal termination. Spasmodic startings of the muscles set in sometimes early in the disease, and recurring every eight or ten minutes, are to be regarded as very unfavourable," p. 29.

The only disease which tetanus can be confounded with, is rabies contagiosa. In the latter, however, there is generally fever ; frequently increased heat of the body. In rabies contagiosa, vomiting is common at the commencement ; not so in tetanus. The delirium, too, of hydrophobia is absent in tetanus. The shooting pain from the sternum to the spine is seldom wanting in tetanus, or present in the other.

Treatment of Tetanus.—Dr. M. believes, that spontaneous cures do occasionally take place in tropical climates. One decided instance of traumatic tetanus giving way to the efforts of nature fell under his own observation. The treatment of idiopathic and symptomatic tetanus is considered the same. For although it is common and proper in the West Indies to apply some stimulating substances, as ol. terebinth. or the like, to recent wounds, together with emollient cataplasms, so as to induce free suppuration, yet when constitutional tetanic symptoms have once commenced, there is little or no dependence on local treatment. By way of prevention, Dr. Clarke advises a slight mercurial ptyalism to be brought on after wounds in hot climates, or under suspicious circumstances. For the same purpose, the complete division of half divided nerves, tendons, &c. might be proper. The Spanish physicians bathe the wound, for an hour or

more, in warm oil, while some subsequently apply lunar caustic, superacetate of lead, &c. The principal general remedies that have been recommended are, the cold affusion, mercury, opiates, wine and bark, the warm bath, cathartics, blisters, antispasmodics. We shall not stop to notice the history of each of these remedies, but give the substance of Dr. M.'s own remarks and experience. During the doctor's first three years residence in Demerara, and in the first eight or ten cases, the *cold affusion* was invariably used, but with so little success that it was ultimately left entirely off, and the warm bath substituted.

Mercury.—Spontaneous salivation has often been observed in tetanic patients whose cases terminated favourably, hence probably the first idea of using mercury. In hot countries tetanus is seldom so rapid as to prevent the introduction of mercury in quantity sufficient to salivate, before the disease runs its course, whether favourably or fatally; and, as in all climates mercury interferes not with other remedies, Dr. M. thinks its administration ought never to be omitted.

“I undoubtedly have had many examples of the good effects from mercury in the cure of this disease. Four grains of calomel given two or three times a day, with three or four drachms of the ointment well rubbed on the neck and spine night and morning, I believe to be excellent practice. A much larger quantity of the ointment may be used on different parts of the body: indeed, the more continued the friction, the better. The constitution labouring under this disease, will mostly appear as proof against the usual effects of this medicine; but when salivation can be brought about, it will, in a great majority of cases be found to be attended with the happiest consequences. Allowing the spontaneous salivation, which sometimes occurs, to be more the effect than the cause of the cure, still we should be inclined to throw in large

quantities of mercury, merely with a view of bringing on any different action in the system."

The submuriate of mercury with scammony or jalap as a purge is also recommended by our author.

Opium.—This appears the sheet-anchor of our author in this disease. He has met with more than a dozen cases where the cure of tetanus could be fairly attributed to this medicine; and he has met with no instance of recovery in which he did not conceive that it bore a principal part. It must be given, however, in very large doses, the system under tetanus being little affected by doses of opium that in other circumstances would produce striking effects.

"A practitioner," says Dr. M. "for whose acuteness and discernment I have great respect, gave to an old man, in my presence, who was in an incipient stage of this disease, about *half an ounce* of tincture of opium in four ounces of rum, as a *first dose*, directing, at the same time, the spirit to be frequently repeated, and the man got perfectly over the complaint in a few days," 57.

Dr. M. directs that an adult should commence with one hundred drops of the tincture, (bowels being opened,) increasing each succeeding dose one-third every two hours, unless sleep or stertor in the breathing ensue; ordering at the same time, wine or ardent spirits, in as large quantities as the patient can be induced to swallow. A pint of spirits, or double that quantity of wine in the twenty-four hours will not be too much. Tincture of opium is also to be rubbed on the spine.

The Warm Bath is regarded by our author in a favourable point of view. It has afforded much present relief on several occasions under his own eye, where the spasmodic twitchings were frequent and troublesome. He depends very little on it, however, and justly observes, that the exertion or movement which the patients must undergo, in order to get into the

bath, will often more than counterbalance any good effects that can be expected from it. Patients are so alive to all external impressions, that the least exertion is often sufficient to excite violent spasms. On this account the patient should be kept as quiet as possible, and very few questions asked him. The chamber should be kept darkened, and every thing tending to excite mental exertion avoided.

Blisters, though recommended in high terms by a few medical practitioners, can only be looked upon in the light of adjuvants. The course of the spine appears the best site of their application.

Bark and Wine.—Dr. M. recommends, that during the exhibition of opium, large quantities of wine or diluted alkohol be administered, in order to second its effects.

Recapitulation.—"The bowels should be kept as free as possible. We must endeavour to bring about an operation every twelve hours. This, even by the aid of strong cathartics, or purgative injections, will be found very difficult to be obtained; the sphincter ani sometimes scarcely admitting the introduction of a clyster-pipe, and the exhibition of the strongest purgatives may often be attended with little or no effect. Sulphate of soda, jalap and colomel, scammony, pil. aloes cum colocynthide, &c. are as proper for this purpose as any other, aided by stimulating clysters, such as solution of muriate or sulphate of soda, with olive oil; the resin of turpentine, suspended by the yolk of an egg; solutions of soap, &c. I have found it, on two or three occasions, impossible to open the bowels freely, till after large quantities of opium had been taken, which seemed to bring about a general relaxation; or until the system had been evidently under the influence of mercury; and, indeed, these are the two medicines on which we are to place the greatest confidence, in the treatment of this disease: they must be given, however, as before remarked, in

large doses, and frequently repeated. I once gave a patient, who is, I believe, still living, ten grains of opium and twenty of calomel, in pills, and five ounces of tincture of opium, in wine, all in the space of twelve hours.

“Next to opium, I certainly look on the preparations of quicksilver as the most valuable. Large quantities of the ointment may be rubbed in on the spine, neck, legs, &c. with repeated doses of submuriate internally. Wine and ardent spirits should be given freely; indeed, the constitution here appears as insensible to their usual effects, as to those of opium; and quantities, which in a state of health, would produce stupid intoxication, now neither exhilarate the spirits, nor disturb that serenity of mind so conspicuous throughout the disease.

“The *warm bath* will often be found a useful auxiliary; when we expect to derive advantages from it, the vessel used should be so capacious, as to allow the patient to be as little confined as possible, and the water should be sufficient to cover the shoulders completely. I have found a common rum puncheon sawed across at the centre, very convenient for this purpose.

“I have generally used blistering plasters, but confess I have never experienced much benefit from their application.

“When the disease is conquered, the patient should take wine and bark for many weeks,” p. 70.

On the above passage I would remark that the local abstractions of blood by leeches and cupping from the neighbourhood of the spine, with subsequent blisters there, are not inconsistent with the plan of treatment recommended by Dr. Morrison. For it must be remembered that such is the unequal distribution of the blood and excitability in the system, under this disease, that one part is completely torpid while another is on the point of extravasation from turgesc-

cence or inflammation. It is evident from this view of the affair, that we must stimulate the torpid organs at the very moment we are employing sedatives, and counter-irritants, or abstracting blood from the congested parts.—Hence too the great value of purgatives and mercury. The former bring back the excitement to the abdominal viscera, and powerfully determinate from the spine: the latter sets all the secretory and excretory apparatus to work, while it equalizes the circulation in every part of the system.

*Observations on the Dysentery of New Orleans. By ARCHIBALD ROBERTSON, M. D. Resident Physician at Northampton.**

SEC. VIII.—About the middle of November, 1814, the expeditionary force destined to act against New Orleans arrived at Jamaica, under the command of Vice-Admiral the Hon. Sir Alexander Cochrane; and the whole fleet of ships of war and transports, having rendezvoused there, took their departure from Negrit Bay, at the west end of that island, about the end of November, full of health and hope.

Before the middle of December, the fleet arrived on the coast of Louisiana, and took steps for disembarking the troops without delay—a measure against which nature seemed to have opposed ample and almost insurmountable obstacles. Moreover, the passage of those lakes which formed the only practicable approach, was obstructed by five large American smacks or gun vessels, mounting several heavy guns each, and admirably adapted, from their build, for operating in those shallow waters.

* I have been obliged, for want of space, to greatly curtail Dr. Robertson's valuable paper, by omitting that part of it which treats on fever—a subject which has occupied a great portion of this work.—J. JOHNSON.

The latter vexatious impediment, however, was soon conquered by our sailors, who showed, on this occasion, all that "*æs triplex*,"—that hardy, careless, characteristic valour for which they are so illustrious. The boats of the fleet, manned and armed, were sent away, and, after a tiresome row of thirty-six hours, succeeded in penning the enemy up in a creek, where they attacked them against the superior odds of their position and their force, and after a furious engagement, captured every one of them. This achievement was decidedly gallant, and would have stood amidst the most brilliant feats of naval warfare, had not the subsequent failure of the main object of the expedition thrown a bleak shade over its lustre.

About the beginning of January, (1815,) bowel complaints, which had previously appeared amongst the boats' crews and the fatigue parties of the army, began to be very rife.—They varied in degree of severity, from the milder symptoms of dysentery to its most aggravated forms. I may enumerate in a few words the symptoms of the disease. The patients, for the most part, complained of severe tormina, tenesmus, scanty blood dejections, want of appetite and strength, general pains and soreness, and strong disposition to vomit on taking either food or drink. The tongue was white or yellow; the eye languid; the pulse above 100, small and easily compressed; the skin often dry, or covered with clammy sweat, but always considerably increased in temperature.

The causes were, generally speaking, obvious enough.—The men had been rowing all day, and sleeping all night in the open boats. They had incautiously drank the brackish water of the lakes, and had sometimes been obliged to eat their beef or pork raw, when, on an emergency, they were deprived of an opportunity of cooking it. They were often drenched with rain, or dripping with spray, without being able to put on dry clothes. Added to all this,

the weather was extremely cold, particularly in the night, the thermometer before sun-rise being often as low as 25 or 26 degrees, rising no higher during the day than 30 or 38 degrees, and seldom above 50.*

The locality of the general rendezvous for the boats was very bad, (though the best that could be found,) being a miry place, covered with reeds, and abounding in miasmal exhalations.

The encampment of the army, too, was on a swampy spot on the left bank of the Mississippi, about six miles from New Orleans. Indeed, the whole vicinity is a swamp, which, after the rains so frequent at that season of the year, became a perfect puddle. Having the Mississippi on their left, they drank its discoloured and polluted water, and were exposed to the effluvium of its slimy mud, as well as to the paludal exhalations of an impracticable wooded morass on their right. The huts, also, in which the troops were sheltered, were far from being impervious either to rain or cold: so that, upon the whole, the army and navy, in point of privations, were much upon a par.

On the first appearance of Dysentery, its treatment was commenced by a flannel roller bound tight round

* The Physiologist might have contemplated with interest, on this occasion, the marked difference in the effect of cold on the European and the African constitutions. While the former were, comparatively, only incommoded, the latter were severely injured by it. Many soldiers of the Negro regiments had their feet frost-bitten, and lost their toes by the consequent gangrene and sphacelus. Some of them even died in the camp or in the boats, from excessive cold. Of our own people, many of the boats' crews, and even of the officers, on their return from boat service, were incapacitated for six or ten days, by pain, numbness, shooting, and tingling of the lower extremities. They expressed their distress to be as great as if their feet and legs, from the knees downwards, had been *one immense chilblain*! Various remedies were tried for this teasing affection; but nothing I could devise gave any relief. Temporary ease was derived from frequently bathing the feet in cold salt water. This peculiar affection I no where find mentioned by writers on the effects of cold.

the abdomen, and ordering flannel clothing next the skin, if the patients had it not already. Saline cathartics, and particularly oleum ricini, with now and then a few grains of calomel were repeatedly given, until the stools were increased in quantity and more freely rendered. At the same time, plentiful dilution with tepid gruel, warm tea, rice, or barley-water, (with a tinge of port-wine and a little sugar, so as to remove its nauseous insipidity, and allure the patient to drink it in such quantities as would prove useful,) as also decoctions of linseed or of gum arabic, I always considered of primary importance as well in promoting the cure, as in alleviating symptoms. Demulcent drinks I hold to be of much moment in this complaint, as they, no doubt, in some measure, defend the irritable or semi-inflamed coats of the bowels from the stimulus of the ingesta, besides sheathing the acrimonious secretions which, during this disease, are unquestionably poured out from the intestinal glands, and supplying the want of excretion from the mucous follicles.—I have had occasion to see even olive oil given with this view, in doses of an ounce or two, and the relief that always followed it, even though it had no laxative effect, was very conspicuous.

When the primæ viæ had been fully evacuated, an attempt was made to restore the natural secretions, and the balance of the circulation, by opening the pores of the skin. Antimonial powder, with opium, was employed for this purpose; but more generally the pulvis ipecacuanhæ compositus, which certainly seemed to succeed best.

Whenever tormina and straining returned in a worse degree than ordinary, a cathartic was given in the morning, followed by a large dose of opium, or an anodyne diaphoretic at night.

Believing, as I firmly do, that wherever there is morbid activity of the vascular, and increased mobility or excitability of the nervous system, (the former

evinced by undue velocity and force of motion of the heart and great vessels, and the latter by morbid involvement of animal heat, general pains, lassitude, &c.) *there* blood-letting is very seldom inadmissible, whatever be the name or nature of the disease,—it is almost unnecessary to say that, in the complaint I am now describing, the lancet formed a leading agent in the *methodus medendi*. Whenever the stools resembled the “*lotura carniū*,” I practised depletion with as much freedom as if there had been active hæmorrhage from the intestines from any other cause;—the amended appearance of the alvine discharges, and the diminution of the pyrexial symptoms not only justified but sanctioned the apparent boldness of a measure, which, I have reason to know, has succeeded equally well in other hands besides my own. Many of our primary cases, however, were not so severe as to require venesection.

By these means, aided by perfect quietude, repose, and low diet, the febrile state soon disappeared, and nothing remained but debility and irregularity of the bowels, which were to be removed by the *mistura cretæ cum opio*, the *infusum quassiæ excelsæ*, or the *mistura cinchonæ*, given thrice or four times a-day, and a gentle laxative once in three or four days.

Many of our earlier and milder cases yielded to this treatment; but those of a severer sort required measures less inert. In these malignant forms of the disease, I began by giving a strong saline or lubricating cathartic. Here, too, blood-letting was very freely practised, when the patients were young and robust, or indeed, whenever the force of the pulse and pyrexia seemed on general principles, to justify it. I never once saw cause to repent of this evacuation, though I have more than once carried it to a great extent. It often moderated local pain of the abdomen, diminished the severity of the griping, and, when practised with prudence, did not perceptibly increase the sub-

sequent debility.—These preliminary steps being taken, I immediately commenced the use of calomel, and pushed on undeviatingly to salivation, from the belief, which seems to be well-founded, of an occult connection betwixt dysentery and a morbid condition of the liver.

The doses I gave were regulated by the constitution of the patients, and the actual state of the symptoms; but *one scruple* night and morning, was the most usual prescription,—seldom less than ten grains thrice a-day! I gave a scruple night and morning so often, and in such a great variety of habits, that I soon ceased to be at all fearful of hypercatharsis, or, indeed, of any other unpleasant effect. It certainly seldom, in any case increased tormina and tenesmus, but generally lessened both very materially, and produced five or six large motions, voided with less straining, and less tinged with blood. I have in this way given 16, 24, or 32 scruples of calomel in the course of half as many days, before the mouth became affected. When the gums were fairly sore, with some ptyalism, the calomel was omitted, the tormina, tenesmus, and general fever disappeared *as a matter of course*, and the bowels gradually returned to their natural state, the stools often changing, in one night's time, from a dark brown or *spinage* colour, to a bright healthy yellow, with the odour of natural fæces. Some tonic or stomachic was prescribed during the days of convalescence; and generally, as soon as the mouth was well, the patients were fit for duty.

Calomel was often thus given alone and uncombined; but often I thought it preferable, on account of occasional symptoms, to conjoin with it two grains of opium, or to give at noon, (in the interval between the doses of calomel,) twelve or fifteen grains of the pulvis ipecacuanhæ compositus.—This was done in order to lessen the irritability of the bowels, and to support the cuticular discharge. Under such management,

every case recovered where no visceral obstructions existed, or where the co-existent disease of the liver was not irretrievable from having passed into disorganization.

As to the fact of visceral obstructions, I believe they are a more frequent occurrence, even in our own climate, than is generally supposed: but I am persuaded that, of those who have lived for any length of time within the tropics, scarcely fewer than *four-fifths* have one viscus or other in the abdomen, more or less altered by morbid action. This opinion is deduced from a very considerable number of dissections of such subjects.

Opium is one of those remedies of doubtful utility in dysentery, which has been by some violently decried, and by most rather sparingly used, from its alleged tendency to suspend the natural secretions, lock up the excretory ducts, and check the transpiration by the skin. Candour obliges me to say that I have used it largely, particularly in the chronic forms of the disease, and that I have never noticed any of the unfavourable effects urged against it; but on the contrary, can bear witness with the illustrious Sydenham, Dr. John Hunter, and several living authors, to its beneficial power. Given after purgatives, it can seldom be unsafe,—and, if it does no more, it procures a temporary truce from the disease. How important a cessation from suffering is, in every illness, but more especially in so endless and harassing a complaint as dysentery, I need not say—prejudices, probably illusory and theoretical, ought to give way to an advantage so substantial.

Nevertheless it must be admitted, that in the early or acute stage of dysentery, this remedy must be administered with a very cautious and discriminating hand,—inasmuch as, at that period of the disease, inflammation either exists overtly, or disguised under some of its peculiar modifications. Under such cir-

cumstances, therefore, it becomes necessary not only to premise the opium with blood-letting and purgatives, but also to combine it with some unirritating diaphoretic, such as pulvis ipecac. aqua acetetis ammoniæ, &c. in order to prevent it from increasing vascular action, and suppressing cutaneous excretion.

Almost the whole body of the profession have concurred in praising injections in this disease. I, of course, defer to the experience of others, while I detail my own. Having found them almost uniformly hurtful, I entirely laid them aside. The irritation produced by the introduction of the pipe, more than counterbalances the soothing effects of the injection. Besides the disagreeableness of this species of remedy, when often repeated, to the good old English habits of delicacy, I have always seen that, were the enema ever so bland, or ever so small in volume, it could not be retained beyond a very few minutes, and always occasioned more straining and tenesmus in the sequel. As a commodious substitute for injections, I have directed patients to insinuate into the anus a *small* crumb or two of opium, softened betwixt their fingers for the purpose;—or have caused warm fomentations to be used to the parts, and bladders of hot water to be applied to the hypogastric region. These are wont to succeed so well, that the patients themselves speak in the strongest terms of the relief afforded by them.

The diet of the sick is of the utmost consequence in this complaint. It should be so regulated that nothing *cold* either in the shape of food or drink, be taken into the stomach. Sago, arrow-root, weak soups, &c. may be used during the pressure of the disease; and animal jellies, and other articles, easy of digestion, during convalescence. When the disease has yielded, it is of the first consequence that we do not prematurely indulge the patient with animal food, even though his appetite strongly crave it; for

it must be obvious that such food will be received into an alimentary canal, as yet by far too weak to digest or assimilate any but a very small portion of it. Hence springs a dreadful source of irritation to the weak and irregular bowels; and I am satisfied that I have seen some fatal relapses of dysentery brought on by the injudicious kindness of the patient's friends, who have clandestinely indulged him with animal diet, under the erroneous impression of thereby strengthening him. In many other instances, I have seen apparently very venial excesses either in the quantity or quality of the food during convalescence, induce true *lienteria*: in truth, the latter complaint is too apt to be the consequence of long-protracted attacks of dysentery, do what we will, and be our dietetic restrictions what they may. I need scarcely add that vegetables and fruit, unless well boiled, and used in very sparing quantity, are quite inadmissible,—owing to their proneness to run into the acetous fermentation, in all instances where the chylo-poetic organs are debilitated.

*Blister*s to the abdomen I have occasionally used, and that with some apparent advantage, in this disease. But I believe, most practical men will agree with me when I say, that if due use has been made of the lancet at the outset of the complaint, the subsequent and subordinate aid of vesicatories will very rarely be any way essential, or necessary. Besides, they labour under the objection of causing often difficult micturition from the absorption of the cantharides; and it must be recollected that, in most cases of dysentery, strangury is already existing, from sympathy betwixt the bladder and the rectum, while the latter is in a state of constant and almost inconceivable irritation from tenesmus. It might be well to try whether the interposition of a bit of muslin betwixt the blister and the skin, would have the effect,

as it is said to have, of preventing the absorption of cantharides.

The advanced-guard of the army was disembarked on the 24th of December, and took up a position on the only road to New Orleans, and there awaited the landing of the remainder. After several minor skirmishes, the troops, (with whom the marines of the fleet and sailors trained to small arms, had previously been incorporated,) were formed into columns, and on the morning of the 8th of January, before day-light, advanced to storm the American lines.

These works were defended by a broad ditch filled with water, as also by a palisade, and a wall mounted with numerous pieces of cannon. The enemy, apprised of our intended invasion, had drawn these lines quite across the only route to New Orleans. They were absolutely inaccessible at their flanks, as their right touched the Mississippi, and their left rested on an impassable wooded morass. This was the spot which the laws of nature as well as the rules of art had concurred to strengthen; this was the strait which the Americans would fain compare to the immortal pass of Thermopylæ; but entrenched, as they were, to the teeth, and fighting, in effect, completely under cover, there was no call for the self-denying devotedness of a Leonidas, and no exercise for either the active or passive valour of Sparta.

The attempt to storm failed: our columns were beat back at every point, with a loss, I believe, of more than five hundred killed, and upwards of twelve hundred wounded.

The expedition being thus foiled in its object, the troops were once more collected on board the fleet, and proceeded off Mobile river, to attack the town of that name. Fort Bowyer, which defends the har-

bour's mouth, being quickly and regularly invested, was captured on the 11th of February: but the ulterior operations were suspended by the arrival, from England, of the news of the peace of Ghent. The troops were disembarked on a sandy uninhabited spot, called *Dauphin Island*, there to await the ratification of the treaty, and the arrival of such supplies of provisions as would enable them to prosecute the voyage homeward.

It is worthy of remark, that, notwithstanding the almost unexampled fatigues and privations of all sorts to which the army and navy had been exposed while before New Orleans, sickness of any kind, up to the 8th of January, had made comparatively little progress amongst them. The bowel complaints, though numerous, were for the most part, easily removed; and no other disease of any consequence prevailed. It is not a little remarkable in the medical history of fleets and armies, that, during the fatigues and sufferings of a hot campaign, or the active progress of warlike operations, the men are very little subject to illness of any sort; as if the elation of hope, and the other great passions with which they are agitated, had the virtue to steel the constitution against the most powerful causes of disease. This circumstance no less curious than true—proudly proves the ætherial origin of our nature, and goes far to assert the almost omnipotency of mind over matter!—No sooner, however, does a great failure, and the dejection it draws after it,—a cessation of operations and a return to the “*vita mollis*” allow the spirit of enterprize to flag, than the previous fatigues, and exposures begin to tell upon the constitution by their usual results—disease. Like a machine wound up beyond its pitch—the excitement of accumulated motives once withdrawn,—the human frame rapidly runs down, and yields with a facility almost as unexpected as its former resistance. Hence, after a campaign, diseases

of every kind are prone to a type of debility and aggravation, and the proportion of deaths is unusually numerous.

Accordingly, in the instance before us, the pressure of ill success began to be severely felt after the failure of the 8th, and the consequent re-embarkation of the army. By this time unremitting fatigue, poor living—and that at short allowance, with the total want of fresh beef and succulent vegetables, not only altered for the worse the character of the bowel complaints, and produced a fatal relapse in some recently cured, but also introduced scurvy, with its multiplied series of perplexing symptoms. Exposure to marsh miasmata, also, produced many cases of fever, which were at first intermittent, but as the weather grew hot, put on the violent remittent, or, more generally, the ardent continued form. The great increase of atmospheric heat which now took place evidently exasperated the type of the prevailing dysentery, as well as that of the fever: this, along with some other facts, which I shall state hereafter, induced me to believe that one common miasm gives rise to these two forms of disease, and that the former is essentially different from the dysentery of cold climates, which, being merely a vicarious discharge from the intestines, owing generally to suppressed perspiration, is, for the most part, rendered milder, if not altogether extinguished by the genial warmth of the season.

Dysentery now put on that aggravated form in which it has so often scourged our camps and fleets; and never shall I forget the terrible force of this invisible enemy. In all cases it was a very baffling untractable disease, but in those who had previously served long in warm climates, and whose livers were thereby affected, it was almost uniformly mortal.—When the disease attacked such persons, it was a subject of melancholy but curious speculation to witness

the headlong course of the malady, and how unavailing any species of treatment invariably proved. It knew neither pause nor hindrance, but like the fabled vulture of ancient mythology, pursued its cruel task from day to day. Dissection always brought to light extensive visceral obstructions, particularly chronic inflammation or abscess of the liver, with or without enlargement of that viscus.

Nothing but experience can convey adequate ideas of the ungovernable nature of this disease, or of the insidious masked approaches of its attack. Days of an indisposition, apparently trivial, sometimes occur, ere the peculiar symptoms of dysentery show themselves, and would induce a practitioner unacquainted with tropical diseases, and unaware of the peculiar character of the prevailing epidemic, to pronounce the complaint trifling, or as being nothing more than slight fever, symptomatic of gastric disorder;—at other times, smarter pyrexia, and occasionally a pain in the right side, obtuse or acute, followed by frequent copious dark-green stools, (like *boiled spinage*,) slightly tinged with blood, are the form of the disease.

In most of the cases, griping was little complained of. There was merely a sense of weight in the hypogastric region, and a copious *flux* of green or dark-brown colluvies, voided without straining. The tongue was covered with a yellow fur, which, in the advanced stage of the disease, became thick, dark, and immoveable as a slab of black marble. The pulse was sharp, frequent and weak: frequent retching and hiccup attended, and a sensation as if all the drink swallowed hot or cool, ran speedily through the intestines. Oftener the complaint would make its attack with the common introductory symptoms, and no pain in the right hypochondrium was felt throughout the disease, either on inspiration, or strong pressure under the false ribs. In whatever garb of disguise it made its appearance, disease of the liver, (as I have

before stated,) and consequently a vitiated state of its secretions, were undoubtedly the primary cause of the mischief. Dissection of the fatal cases showed structural derangement,—a soft friable condition, and general suppuration of that gland. I have often found two separate abscesses in the parenchyma of its large lobe, the one generally less deep-seated than the other, and containing, in some instances, a quart of pus, similar in colour and consistence to what is usually found in psoas abscesses. How such extensive disorganization, and formation of matter could take place without any preceding palpable indication of local mischief, is to me still a mystery. But such was the fact.*

* Since these observations were first published in the *Edinburgh Journal*, almost every one has expressed his surprise at the co-existence of such extensive hepatic disease with tropical dysentery: nay, the thing is so striking in itself, and is so contrary to established opinion, that not a few have gone so far as to deny it altogether, or to assert that it must be a very rare occurrence indeed; and that the affection of the liver is merely contingent, and not necessarily connected with dysentery. I think I am warranted by facts in maintaining the contrary,—viz. That the co-existence is very frequent, if not uniform; and that the connexion is no less strict than that of cause and effect.

I can, however, well excuse a degree of scepticism on this point, knowing that what happened to myself may equally happen to others,—namely, that many cases of dysentery may be examined after death, without the concomitant disease of the liver being discovered:—for who would dream of cutting minutely into that viscus, in a disease generally supposed to bear no relation to it?

It was by accident I first discovered the fact, and I shall relate it concisely, just as it happened: a Naval Officer, for whose talents and virtues I shall ever entertain the highest respect, whose memory I shall ever affectionately cherish, and whose death I shall ever regret as the loss of a valued friend, was the first on board *H. M. S. Cydnus* that fell a martyr to dysentery off New Orleans.—He happened to die at sea, and it became desirable to preserve his body until we should reach some port, where the funeral honours due to his rank might be decorously paid. In order to effect this, it became necessary to remove the intestines. While doing so, I ascertained that the liver was much enlarged, and therefore thought that it also had better be removed. Having

On the villous coat of the colon and rectum, there were numerous excoriated points, with small superficial ulcers here and there; but no morbid alterations were found *there* sufficient to account for death:—no gangrene—no ravages in short, like those related by Sir John Pringle, Harty, and others, in their accounts of this malady.

separated it from its lateral connections, I passed my hand up under the ribs in order to detach it from the diaphragm. While making a slight pressure for the latter purpose, I was astonished to find the points of my fingers pass through the thin parietes of a large abscess in the upper and central part of the right lobe, from which upwards of a quart of pus forthwith flowed. After the liver had been removed and laid out for minute inspection: I found the abscess of such extent, and so lined in its inner surface with a thick, fretted, and irregular exudation of coagulable lymph, that it resembled a familiar and homely object,—namely, a large winter glove lined with worsted!—On accurate examination, a second abscess was found, lower down in the large lobe, containing a pint of pus.

This Officer had never at any period of the disease felt any pain in his side:—from his general intelligence, and from the accurate descriptions he gave me daily of his minutest sensations, I am convinced he would have mentioned that pain, had it existed even to the extent of a “*sensus molestiæ*.” Besides, he was one of the last men in the world that one would have suspected of hepatic affection, being florid in complexion, and having previously enjoyed the best health all his life.

Instructed by this insidious case, I had my eye to the liver ever afterwards; but pain of side, or pain on pressure under the ribs, was by no means often felt, though dissection after death brought to light hepatic disorganization equally extensive as in the above case. In many, the liver to appearance, had the colour and size of health, and it was not till on cutting into its parenchymatous substance that the extensive abscesses were discovered.

These facts are of such high importance in the pathology of dysentery, and so much depends upon the degree of credit that may be attached to them, that I am sincerely glad in being *now* able to say, that they do not rest upon my solitary or isolated observation. Within these few days I have been favoured with an excellent and most interesting communication from James Simpson, Esq. Surgeon, R. N. in which he details to me the cases and appearances on dissection of several dysenterics that were treated by him in the East Indies. At the time he made the observation, he was not aware that similar ones had been made by myself in the Western Hemisphere; therefore his remarks must carry with

In fact, (to give a condensed view of the whole matter,) the phenomena of the cases that recovered, as well as the morbid appearances of those that died, impressed upon my mind a conviction that the diseased condition of the liver was the soil from which dysentery drew its malignant growth, strength, and nurture. This was the “*fons et origo mali* ;” by it the dysentery was excited, and only by *its* removal could it be removed ! This view of the disease I conceive to be of great consequence, and trust it will meet with due consideration from the profession, inasmuch as it is a view not taken up hastily, or out of complaisance to a favourite hypothesis, but deduced from nearly two hundred cases, and built upon the corner-stone of morbid dissections. I hope the time is not far distant when more accurate observation will teach medical men at large, to regard this disease merely as secondary to, and symptomatic of hepatic affection, and to seek its more immediate cause in a morbid condition of that important organ, the liver. Whatever may be the *mode* of connection* between

them the force of unbiassed and independent observation. The symptoms before, and the morbid changes after, death, were substantially—nay, exactly—the same as I have detailed in this paper, and in my Inaugural Dissertation : and Mr. Simpson, speaking from the facts he has so often witnessed, expresses his conviction that “future experience will unfold to us that liver disease is an inseparable attendant of dysentery in warm climates.”—I am sorry that want of space prevents me from copying more amply his able and satisfactory details. I have reason to know that the observations of some other practitioners exactly concur with those of Mr. Simpson and myself.

* About the mode of that connection I have indeed speculated pretty freely and pretty largely elsewhere, having employed a good many pages of my Thesis in the discussion of the ratio symptomatum as well as of the ratio causarum—yet I must confess, that the opinions are purely, or at least in a great measure speculative ; and that they are not satisfactory, even to my own mind.

I shall not further detain the reader in this place, but pass the matter over entirely, resigning to writers of greater native talent, and better inured to habits of difficult investigation, the task of

hepatic derangement and dysentery, I am convinced from analyzing my own sensations, as well as from having counted in others the links of the pathological chain, that, at least in tropical climates, these two diseases are connected like cause and effect. The practice which most readily removes the disease, too, tends much to confirm me in this conviction ; for the “mercurial method” I have pushed to a great extent, and its results have been such as to give it a very decided preference in my estimation. Calomel, (that great specific in obstructions of the liver, and justly styled by Dr. Curry, of London, a *cholagogue*,) given in large doses—say one scruple twice a-day—combined with opium, to cause it to be retained in the system, corrects the condition of the liver by emulging its ducts, unloading its congested or over-gorged vessels, removing undue determinations of blood to its yielding texture, prompting the healthy secretion

establishing a theory of the disease which shall at once be rational, and shall satisfactorily explain all the phenomena.

I may, however, be permitted to hint that no hypothesis which has simplicity for its basis will ever explain this disease : unquestionably Dr. Johnson’s leading idea is a most valuable one, viz. that in our investigations of this malady we must seek its source not in one morbid cause, but in a series of morbid causes.

I wish it to be distinctly understood that it is my inability alone that induces me not to attempt the theory of this disease ; for I shall never fall in with that tone of affected contempt for all theories, in which presumptuous dulness so often shelters its imbecility, and vapid indolence so often masks its habitual and insuperable torpor. Such ill-bestowed contempt may be sufficiently reprovèd by simply stating the undeniable fact, that not only in medical, but in every other branch of natural and experimental science, few brilliant discoveries have been made except by those acute and industrious men who were labouring to establish some darling hypothesis. Though they were often disappointed of the results they had in view, still they were generally compensated by the discovery of something equally or more valuable ;—just as the peasant who was told to dig for hidden treasure, though disappointed of the prize he expected, derived a more rich and permanent treasure, from the digging and fertilizing of the land during his vain search.

of its peculiar fluid, and thereby resolves Pyrexia.—As soon as ptyalism takes place, the dysenteric symptoms disappear, and the appetite gradually returns. Upon the whole, my own experience, as well as that of some others who served on this expedition, warrants a far more certain expectation from this mode of treatment than from the alternation of purgatives with astringents, or any other heretofore in use.—I must here observe, however, that I by no means go the length of saying that dysentery in our own climate always requires the excitement of ptyalism by mercury for its cure; because with us it is almost always a slight disease, and compared with the fell and fatal form of tropical flux, might be termed the “spurious dysentery.” In ordinary cases, therefore, to push mercury the whole length of salivation, would be merely substituting one ailment, and that perhaps a more troublesome one, for another less so: (for let it ever be remembered that ptyalism is not without its inconveniencies, and sometimes not without its dangers, as I myself have seen:) consequently in such instances, if we equalize the circulation by the warm bath, a purgative, and a sudorific or two, we shall generally find the disease yield. Frequent discharges of slimy mucus, attended with tormina, tenesmus, and feverishness, though designated by the general name of dysentery, are, in this country, often dependent merely on ærial vicissitudes and consequent suppression of the cuticular discharge, and differ widely both in their cause and character from the *true* dysentery of warmer, but less salubrious regions. But even in this climate, I contend, the principles of cure here laid down will apply with utility, and that in cases which resist the more ordinary treatment, calomel given in larger or smaller doses, (according to circumstances,) will be equally beneficial as within the tropics, provided the patient be always kept in a room whose temperature is between 60 and 70.

I have no hesitation in affirming that at New Orleans the success of the treatment by calomel was far greater than that by the usual mode, and I shall here relate a fact which may be regarded as decisive of the rival merits of the two methods of cure. The *Cydnus* frigate, in which I served, remained in the Gulf of Mexico, after all the rest of our force had retired. From the large expenditure of calomel, I at last had none left, and there was not a grain to be procured.—At this time I had several cases of dysentery, which, from necessity, I was obliged to treat, for several days, on the *old* plan, by neutral salts or oleum ricini alternated with anodyne sudorifics, rhubarb, diluents, mistura cretacea, &c. One case was, indeed, of so bad a type that I had made up my mind for its ending fatally. Luckily, however, our arrival at the Havanna enabled me to procure a supply of good calomel; and I immediately commenced with ten-grain doses thrice a-day. *Next morning* the patient was better; had passed a more tolerable night; had less tormina and tenesmus, and a cleaner tongue. I increased the dose to one scruple night and morning, and thenceforth his improvement was perceptible from day to day. The pyrexia soon abated, and, in ten days, his dejections from being green and foetid, had recovered the natural yellow colour or nearly so. No complaint remained but a sore mouth. This patient, like most of the others, had been very liberally bled at the onset of the disorder. He is now living, (so far as I know,) and is an example of the superior efficacy of this mode of treatment.—The above is merely one of many instances where I have seen calomel work rapidly, and like a *charm*.

To prove with how little apprehension calomel may be given to persons of all ages, I may state that to a boy of 14, *one hundred and fifty-two* grains were given during the acute stage of a most dangerous

attack of dysentery, before his mouth became fairly sore!! He fully recovered.

Though mercury had, in this manner, such commanding influence over the disease, still experience here was not always uniform, for there were several vexatious instances where it failed. I do not speak of the fatal cases, of which, unhappily we had fifteen, (for in them neither laxatives, astringents, fomentations, blisters, opiates, mercurial frictions on the abdomen, nor calomel pushed to salivation, ever were able to keep off the unhappy event,) but expressly of those few instances where the patients, after being apparently cured, relapsed without any assignable cause, or where ptyalism mitigated the symptoms somewhat—perhaps even suspended the disease entirely until the mouth was well, and then it returned with much of its original violence. The disease thus ran into the chronic form, and harassed the patient for weeks, or even months—with the various symptoms arising from a weak, irritable condition of the *primæ viæ*, irregular hepatic secretion, and imperfect formation of the chyme.—The chief of these symptoms were vomiting after meals, night sweats, febriculæ, watching, arid skin, pains in the lower belly, occasional tenesmus, frequent costiveness, followed by spontaneous diarrhœa and discharges of blood, attended also with frequent prolapsus ani and difficult micturition.

In conducting the cure, very delicate management was requisite;—in fact the disease required rather to be led than driven. A strictly regulated diet, and the use of flannel next the skin, were of the highest consequence. At the same time the patient was put under a gentle and gradual course of calomel, taking three or four grains morning and evening, and rubbing in a portion of mercurial ointment on the belly and right side. Laxatives and astringents were em-

ployed occasionally, but, above all, the greatest use was made of opium both internally, and locally per anum, and it really effected most conspicuous benefit. Sulphate of zinc I now and then tried; but from the nausea which it excited, even in three grain pills morning and evening, and from its apparent inefficacy in the disease, I should scarcely, in future, be tempted to give it further trials. The tonic power of Peruvian bark was very useful both as an astringent to the bowels, and as a restorative to the whole system. When the mouth was recovered from the first gentle course of mercury, if the complaint had not yielded, I did not hesitate to use calomel again and again in the same gradual manner, till the gums were repeatedly somewhat affected, and then gave tonics as before. This assiduous perseverance, and the patient attention which it implied, I am happy to say, were well rewarded—many patients were thus recovered from a state—not hopeless indeed—but very precarious, and were re-established in firm health.

It is worthy of remark that relapses in this disease are, more than in any other I know, peculiarly frequent and fatal. Most of the deaths occurred in relapsed cases. In one instance a patient relapsed thrice, and the third was more untractable than the preceding; in him a large abscess sprang up in the epigastric region towards the close of the disease, and burst—discharging profusely bloody and bilious sordes, evincing that the abscess had its radicle in the liver, as dissection afterwards more clearly proved. In two or three instances, the belly, during convalescence, became tumid and tense—and remained thus for a considerable time after their recovery from dysentery. This tumefaction the patients attributed to the state of their liver, and believed themselves to be “Liver-grown,” as they expressed it; but from the spontaneous and often sudden disappearance of

this peculiar symptom, I am rather induced to ascribe the distension to the secretion and extrication of flatus, from the weakened villous coat of the intestines, and from its accumulation in their convolutions and in the cells of the colon.

I never had any reason to suspect this disease, or the pyrexia which ushered it in, and attended it, to be in any measure contagious; inasmuch as it did not appear indiscriminately, or spread from man to man by communication; but was entirely confined, both primarily and ultimately, to that portion of the crew whom duty led on shore, or who were employed in the boats on the river *Apalachicola*. Every boat's crew that returned from such service was sure to bring a reinforcement to the sick list; and out of six new patients thus added, three would be found labouring under ardent fever—(for the weather was by this time hot,) and the remaining three under dysentery of the above-described type. From this fact, repeatedly and constantly observed, I am induced to draw the conclusion that both these complaints are excited by one and the same special miasma; for, of a given number of men taken ill in consequence of exposure to the predisposing and exciting causes, it seemed as uncertain as the toss-up of a half-penny whether the one or the other of these diseases would develope itself in an individual or individuals so exposed. This, however, I advance rather as an opinion countenanced by facts, than as being in itself a fact; for I am well aware of the weight of authority that is against me on this point, and must confess that my means of observation have not been sufficiently extensive to warrant a *positive* induction.

PART III.

TROPICAL HYGIENE ;

OR,

HINTS FOR THE PRESERVATION OF HEALTH IN ALL
HOT CLIMATEE.

Prestat argento, superatque fulvum
Sanitas aurum, superatque cenum
Quamvis ingentem, validæque vires
Omnia prestant.

As prevention is better than cure, it might seem more natural to have detailed the means of preserving health, before entering on the treatment of diseases themselves. This plan has accordingly been adopted by Dr. Moseley ; but I think it an injudicious one. In describing *effects*, I have traced pretty minutely their *causes* ; and in that way must have obviated a vast tautology in this part of the work. Besides, by exhibiting both causes and effects in one view, I am convinced that the salutary impression is always stronger. For example ; could the gravest anathema, denounced with all due solemnity, against sleeping ashore on insalubrious coasts, excite half so much interest in the mind of an European, as the fatal catastrophe at Edam Island ?—But another great point is gained by this plan. The various reasonings and remarks which accompanied the treatment and description of diseases, will enable even the general reader to comprehend, with infinitely more ease, the *rationale* of those prophylactic measures, which I am now to delineate ; and which, at every step, will re-

call to his memory the deplorable effects resulting from a contempt of them. This is no inconsiderable object: for we all know the gratification which springs from understanding what we read. And, in truth, it is a pleasure—nay, it is a positive advantage, to be able to explain, even on a *false theory*, the principles of a *useful practice*. But as theory, in this instance at least, is the legitimate offspring of experience, so, I trust, the superstructure is as firm as the foundation.

It has been remarked, by a very competent judge, “that by taking the general outline of indigenous customs for our guide, if we err, it will be on the safe side.” This is a good rule; but unfortunately it is impracticable—by those, at least, who stand most in need of one. For, before we can become acquainted with these indigenous customs, it will be too late for many of us to adopt them; and could we see them at one *coup d’œil*, when we first enter a tropical climate, how are we to avail ourselves of them, unless they happen to be in unison with the habits of our countrymen already resident there, who would not fail to sneer at the adoption of any plan which had not the sanction of their superior experience. But independently of this, it would be strange if the progress which has been made in the knowledge of the animal economy, as well as in other sciences, did not enable us to correct many “indigenous customs,” which, in reality, have ignorance, superstition, or even vice for their foundation. This applies particularly to the Eastern World, where the natives are neither in a state of nature, nor yet refinement; but where we see a strange medley of ludicrous and ridiculous customs—of Hindoo and Mahommedan manners, from which the European philosopher may glean much useful local knowledge, while he exercises his reason and discrimination, in separating the grain from the chaff.

Another advice has been given us; namely, to ob-

serve and imitate the conduct of our own countrymen long resident in the climate. This is certainly the most practicable; but, in my opinion, it is not the safest plan. And for this plain reason, that *residence* alone confers on them immunities and privileges, of which it would be death for us, in many instances, to claim a participation, before the period of our probation has expired. I think I shall be able to show, hereafter, that the unseasoned European may apply, with safety, certain preventive checks to the influence of climate, which would be inconvenient, if not hazardous, to those on whom the said influence had long operated. The stranger, then, must go with the general stream of society, especially at the beginning; but there is no situation even here, where he may not obviate, in a great measure, the first and most dangerous effects of the new climate, by a strict observance of two fundamental rules—**TEMPERANCE** and **COOLNESS**. The latter, indeed, includes the former; and, simple as it may appear, it is, in reality, the grand principle of Inter-tropical Hygiene, which must ever be kept in view, and regulate all our measures for the preservation of health.

Common sense, independently of all observation or reasoning on the subject, might, *a priori*, come to this conclusion. From *heat* spring all those effects which originally *predispose* to the reception or operation of other morbid causes. And how can we obviate these effects of *heat* but by calling in the aid of its antagonist, *cold*.* To the *sudden* application of the *latter*, after the *former* has effected its baneful influence on the human frame, I have traced most of those diseases attributable to climate; nothing, therefore, can be more reasonable, than that our great object is to moderate, by all possible means, the *heat*, and habituate

* I overlook the useless litigation respecting cold being the absence of heat.

ourselves from the beginning to the impressions of cold. The result will be, that we shall thereby bid defiance to the alternations or *vicissitudes* of both these powerful agents. This is, in truth, the grand secret of counteracting the influence of tropical climates on European constitutions; and its practical application to the common purposes of life, as well as to particular exigencies, it shall now be my task to render as easy and intelligible as I can. For the sake of perspicuity, I shall here, as hitherto, class my observations under separate heads; though, from the nature of the subject, I shall consider myself much less tied down to forms, than in the two preceding parts of the essay; and consequently shall not be over nice in confining myself to a dry, didactic rehearsal of medical rules and precautions. The scope and purport of any digression, however, shall always point to my principal design—the preservation of health.

DRESS.

SEC. I.—I shall not stop here, to inquire whether this be an unnecessary luxury of our own invention, or originally designed for us by our Creator. The force of habit is no doubt, great; and the Canadian who, in reply to the European's inquiry, respecting his ability to bear cold applied to his naked body, observed, that “he was *all face*,” gave no bad elucidation of the affair. Passing over the great African peninsula, where man enjoys that happy state of nudity and nature, mental as well as corporeal, on which our learned philosophers have lavished such *merited* encomiums, we come to the ancient and civilized race of Hindoos; and here, too, we shall be constrained to admire the almost omnipotent power

of custom, as exemplified in the persons of some of the first objects that arrest our attention.

The habiliment of the Bengal *dandy* or waterman, who rows or drags our *budjrow* up the Ganges, consists in a small, narrow piece of cloth [doty] passed between the thighs, and fastened before and behind to a piece of stout packthread, that encircles the waist. In this dress, or undress, corresponding pretty nearly to the *fig-leaf* of our great progenitor, he exposes his skin to the action of a tropical sun—a deluge of rain, or a piercing *north-wester*, with equal indifference! After “tugging at the oar,” for hours together, in the scorching noontide heat, till perspiration issues from every pore, he darts overboard, when necessary, with the track-rope on his shoulder, and wades through puddles and marshes—this moment up to the middle, or the shoulders in water—the next, in the open air, with a rapid evaporation from the whole surface of his body! All this, too, on a scanty meal of rice, being seldom paid more than—*three pence per day board wages!*

Here is one of those indigenous customs, which we shall not find it very safe to imitate; though many of our keen European sportsmen have undergone for pleasure, or in search of a snipe, what the poor *dandy* is forced to perform for a livelihood. It is hardly necessary to remark, that such pursuits are at the risk of life, and are highly destructive of health.

But, independent of habit, Nature has previously done a great deal toward the security of the *dandy*, by forming the *colour*, and in some respects the *texture*, of his skin, in such a manner, that the extreme vessels on the surface are neither so violently stimulated by the heat, nor so easily struck torpid by sudden transitions to cold. Certain it is, that the action of the perspiratory vessels, too, is different from that of the same vessels in Europeans—at least, they secrete a very different kind of fluid; being more of

an oily and tenacious nature than the sweat of the latter. This, in conjunction with the oil so assiduously and regularly rubbed over the surface every day by all ranks and casts of both sexes, must greatly tend to preserve a softness and pliability of the skin, and a moderate, equable flow of perspiration.*

But if we look beyond the hardy and labouring casts of natives, we observe both Hindoo and Mahomedan guarding most cautiously against solar heat, as well as cold. The *turban* and *cummerband* meet our eye at every step:—the former, to defend the head from the direct rays of a powerful sun; the latter, apparently, for the purpose of preserving the important viscera of the abdomen from the deleterious impressions of cold. This [cummerband] is certainly a most valuable part of their dress; and one that is highly deserving of imitation.

Such are the *essential* articles of native dress; the light, flowing robes of cotton, silk, calico, &c. varying according to the taste or circumstances of the wearer, and being more for ornament than use. A very good substitute for the *turban* is a large cotton handkerchief, folded up in the hat; and where we are exposed to the direct influence of solar heat, it may, with much advantage, be kept moistened with water. In situations where atmospherical vicissitudes are sudden, a fine shawl round the waist forms an excellent *cummerband*, and should never be neglected, especially by those who have been some time in the country, or whose bowels are in any degree tender.

When we enter the tropics, we must bid adieu to

* It is curious, that the upper classes of native ladies, especially Mahomedan, as if determined that nothing of European complexion should appertain to them, are in the habit of staining red, with the *mindy* or hinna plant, the palms of their hands and soles of their feet, the only parts of the external surface where the *rete mucosum*, or seat of colour among them, cannot maintain its deep tint, on account of the friction.

the luxury of linen—if what is both uncomfortable and unsafe, in those climates, can be styled a luxury. There are many substantial reasons for so doing. Cotton, from its slowness as a conductor of heat is admirably adapted for the tropics. It must be recollected, that the temperature of the atmosphere, *sub dio*, in the hot seasons, exceeds that of the blood by many degrees; and even in the shade, it too often equals, or rises above, the heat of the body's *surface*, which is always, during health, some degrees below 97°. Here, then, we have a covering which is *cooler* than linen; inasmuch as it conducts more slowly the *excess* of external heat to our bodies. But this is not the only advantage, though a great one. When a *vicissitude* takes place, and the atmospherical temperature sinks suddenly far below that of the body, the cotton, still faithful to its trust, abstracts more slowly the heat *from* our bodies, and thus preserves a more steady equilibrium there. To all these must be added the facility with which it absorbs the perspiration; while linen would feel quite wet, and during the exposure to a breeze under such circumstances, would often occasion a shiver, and be followed by dangerous consequences.

That woollen and cotton should be *warmer* than linen in low temperatures, will be readily granted; but that it should be *cooler* in high temperatures, will probably be much doubted. If the following easy experiment be tried, the result will decide the point in question. Let two beds be placed in the same room, at Madras, we will say, when the thermometer stands at 90°; and let one be covered with a pair of blankets, the other with a pair of linen sheets, during the day. On removing both coverings in the evening, the bed on which were placed the blankets, will be found *cool* and pleasant; the other uncomfortably warm. The reason is obvious. The linen readily transmitted the heat of the atmosphere to all parts of the subjacent

bed; the woollen, on the contrary, as a non-conductor, prevented the bed from acquiring the atmospherical range of temperature, simply by obstructing the transmission of heat from without. This experiment not only proves the position, but furnishes us with a grateful and salutary luxury, free of trouble or expense.—The musical ladies of India are not unacquainted with this secret, since they take care to keep their pianos well covered with *blankets* in the *hot season*, to defend them from the heat, and prevent their warping.

From this view of the subject, *flannel* might be supposed superior to *cotton*; and indeed, at certain seasons, in particular places—for instance, Ceylon, Bombay, and Canton, where the mercury often takes a wide range, in a very short space of time, the *former* is a safer covering than the latter, and is adopted by many experienced and seasoned Europeans. But, in general, flannel is inconvenient, for three reasons. First, it is too heavy; an insuperable objection. Secondly, where the temperature of the atmosphere ranges pretty steadily a little below that of the skin, the flannel is much too slow a conductor of heat *from* the body. Thirdly, the spicul of flannel prove too irritating, and *increase* the action of the perspiratory vessels on the surface, where our great object is to *moderate* that process. From the second and third objections, indeed, even cotton or calico is not quite free, unless of a fine fabric, when its good qualities far counterbalance any inconvenience in the above respects.

In some of the upper provinces of Bengal, where the summer is intensely hot, and the winter sharp, the dress of native shepherds, who are exposed to all weather, consists in a blanket gathered in at one end, which goes over the head, the rest hanging down on all sides like a cloak. This answers the triple purpose of a *chattah* in the summer, to *keep out* the heat

—of a tent in the rainy season to throw off the wet—and of a coat in the winter, to defend the body from the piercing cold. Hence our ridicule of the Portuguese and Spaniards, in various parts of the world, for wearing their long black cloaks in summer, “*to keep them cool,*” is founded on prejudice rather than considerate observation.

The necessity which tyrant custom—perhaps policy, has imposed on us, of continuing to appear in European dress—particularly in *uniforms*, on almost all public occasions, and in all formal parties, under a burning sky, is not one of the least miseries of a tropical life! It is true, that this ceremony is often waved, in the more social circles that gather round the supper-table, where the light, cool, and elegant vestures of the East, supersede the cumbrous garb of Northern climates. It is certainly laughable, or rather pitiable enough, to behold, for some time after each fresh importation from Europe, a number of *griffinish* sticklers for decorum, whom no persuasions can induce to cast their *exuviae*, even in the most affable company, pinioned, as it were, in their stiff habiliments, while the streams of perspiration that issue from every pore, and ooze through various angles of their dress, might almost induce us to fear that they were on the point of realizing Hamlet’s wish; and that, in good earnest, their

“Solid flesh would melt—

“Thaw, and resolve itself in a dew!”

It too often happens, however, that a spice of ceremony attaches to the kind host—or perhaps hostess, in which case, as no encouragement will be given to derobe, the poor griffin must fret and fume, with prickly heat and perspiration, till the *regalement* is concluded. By this time he is, doubtless, in an excellent condition for encountering the raw, chilling vapours of the night, on his way home!

It were “a consummation devoutly to be wished,”

—though, I fear, little to be expected, that the European badges of distinction, in exterior decoration, could be dispensed with, at all festivals, public and private—formal, social, or domestic, within the torrid zone. It requires but the most superficial glance to perceive, that coolness during our repasts is salutary, as well as comfortable; and that, from the extensive sympathies existing between the skin and several important organs, particularly the stomach and liver, the converse of the position is equally true; especially as, in the *latter* case, we are led a little too much to the use of “gently stimulating liquids, to support the discharge; the bad consequences of which are pointed out at page 23, vol. i. of this essay, and will be again considered in the section on Drink.*

There is an injurious practice, into which almost every European is led, on first visiting a tropical climate, but particularly the Eastern world, which has never been noticed, I believe, by medical writers, though well entitled to consideration. In the country last mentioned, body linen, or rather cotton is remarkably cheap, and washing is performed on such moderate terms, that one hundred shirts may be even *bleached* for about 10s. sterling, on an average. A large stock of these useful articles is, then, the first object of northern strangers, which “*Blackey*,” indeed, knows full well, and takes especial care to turn to his own advantage. But this is a trifling consideration.—The European, contemplating, with great satisfaction the multitude of changes he has thus cheaply amassed, and calculating the very reasonable terms of ablution, determines to enjoy in its fullest extent a luxury, which he deems both salutary and grateful, independently of all considerations respecting appearance. It

* I am sorry to learn that European Habilliments and *Regimentals* are still *more* in use on all occasions of festivity now, than in my time, in India. Nothing can be *worse* policy, with all due submission to their High Mightinesses the Nabobs of the East.

is therefore very common to see him shift his linen three or four times a-day, during the period of his novitiate, when perspiration is indeed superabundant. But, let me assure him, that he is pursuing an injudicious,—nay, an injurious system; that the fluid alluded to, already in excess, is thus powerfully solicited; and the action of the perspiratory vessels, with all their associations, morbidly increased, instead of being restrained. But what is to be done? The newly arrived European justly observes, that he finds himself drenched with sweat three or four times a-day, in which state he cannot remain with either safety or comfort. Certainly it would be useless to point out the evil, without suggesting the remedy; and happily it may be obviated to a considerable extent, in a very simple and easy manner. In those climates, when linen becomes wet in a few hours with perspiration, it by no means follows that it is soiled thereby, in any material degree. It should not, therefore, be consigned to the wash, but carefully dried, and *worn again*, once, or even twice; and that, too, without the smallest infringement on the laws of personal cleanliness, but with the most salutary effect on the health. It is astonishing how much less exhausting is the linen, which has been once or twice impregnated with the fluid of perspiration, than that which is fresh from the mangle. By this plan, no more than one shirt is rendered unfit for use every day; and in cool weather, or at sea, not more, perhaps, than four shirts a week. Necessity, the mother of invention, first taught me this piece of knowledge, in consequence of having lost my stock once, by sailing suddenly from Trincomalee; but I know that, however trivial the circumstance may *appear*, an attention to what I have related, will, in reality, prove more beneficial than precautions of seemingly greater magnitude. Its rationale is in direct unison with the grand and fundamental object in tropical prophylac-

tics—TO MODERATE, WITHOUT CHECKING THE CUTICULAR DISCHARGE.

The property which *frequent* change of linen has, in exciting cuticular secretion, and the effects resulting from the sympathy of the skin with the stomach, liver, and lungs, may account, in a great measure, for the superior health which accompanies cleanliness, in our own climate ; and, on the contrary, for the diseases of the indigent and slovenly, which are almost invariably connected with, or dependent on, irregularity or suppression of the cuticular discharge. Intelligent females well know the *peculiar effect* of clean linen on themselves, at particular periods.

To the above observations on dress, I may add, that no European should, where he can avoid it, expose himself to the sun between the hours of ten and four in the day. If forced, during that period, to be out of doors, the *chattah* should never be neglected, if he wish to guard against *coup de soleil*, or some other dangerous consequence of imprudent exposure.

F O O D.

SEC. II.—Although I entirely agree with Celsus, that—“*sanis omnia sana;*” and with a late eminent physician, that an attention to *quantity* is of infinitely more consequence than *quality* in our repasts ; and although I also believe, that an over fastidious regard to *either* will render us unfit for society, and not more healthy after all ; yet, when we change our native and temperate skies of Europe for the torrid zone, many of us may find, when it is too late, that we can hardly attend too strictly to the quantity and quality of our food, during the period of assimilation, at least, to the new climate ; and that a due regula-

tion of this important non-natural will turn out a powerful engine in the preservation of health.

It is now pretty generally known, from dire experience, indeed, that instead of a disposition to *debility and putrescency*, an inflammatory diathesis, or tendency to plethora, characterises the European and his diseases, for a year or two, at least, after his arrival between the tropics; and hence provident Nature endeavours to guard against the evil, by diminishing our relish for food. But alas! how prone are we to spur the jaded appetite, not only “by dishes tortured from their native taste,” but by the more dangerous stimulants of wine or other liquors, as well as condiments and spices, which should be reserved for that general relaxation and debility which unavoidably supervene during a *protracted residence* in sultry climates. Here is an instance where we cannot *safely* imitate the seasoned European. Indeed; there are no points of Hygiene, to which the attention of a new comer should be more particularly directed, than to the *quantity and simplicity* of his viands; especially as they are practical points entirely within his own superintendence, and a due regulation of which, is not at all calculated to draw on him the observation of others—a very great advantage.

Every valetudinarian, particularly the hectic, knows full well the *febrile paroxysm* which follows a full meal: the same takes place in every individual, more or less, whatever may be the state of health at the time. How cautious, then, should we be, of exacerbating these natural paroxysms, when placed in situations where various *other* febrific causes are constantly impending over, or even assailing us! The febrile stricture which obtains on the surface of our bodies, and in the secreting vessels of the liver, during the *gastric digestion* of our food, as evinced by a diminution of the cutaneous and hepatic secretions, (vide page 222, vol. i.) will, of course, be proportioned

to the duration and difficulty of that process in the stomach, and to the quantity of ingesta; and as a corresponding *increase* of the two secretions succeeds, when the chyme passes into the intestines, we see clearly the propriety of moderating them by abstemiousness, since they are already in *excess* from the heat of the climate alone, and this excess is one of the first links, in the chain of causes and effects, that leads ultimately to various derangements of function and structure in important organs, as exemplified in hepatitis, dysentery, and in many parts of this essay.

That vegetable food, generally speaking, is better adapted to a tropical climate than animal, I think we may admit, and particularly among unseasoned Europeans:—not that it is quicker or easier of digestion, (it certainly is slower in this respect,) but it excites less commotion in the system during that process, and is not so apt to induce plethora afterwards. It is very questionable whether the ancient Hindoo legislators had not an eye rather to policy than health, when they introduced the prohibition of animal food as a divine mandate.—They probably thought, and in my opinion with good reason, that the injunction would tend to diffuse a more humane disposition among the people, by strongly reprobating the effusion of blood, or depriving any being of existence; and these prejudices were admirably sustained by the doctrine of transmigration.

But, whatever might have been the medical objections of BRAMHA to carnivorous banquets, certain it is, that a race of what now may come under the denomination of “*natives*,” (the Mahomedans,) amounting to, perhaps, a seventh or eighth of the whole population, make no scruple of indulging freely in most kinds of animal food: who, in the face of the shuddering Hindoo, will sacrilegiously slay and eat that great Indian deity, the *cow*; and who, in their turn,

look with perfect abhorrence on the polluted Englishman, who regales himself—not, indeed, on four-footed deity, but in the Mussulman's opinion, with worse than cannibalism, on devil incarnate—PORK! Yet Hindoo, Mahomedan, and European—at least, the two first, while *moderation* is observed in their respective meals, enjoy equal health, and attain equal longevity.

If, however, we critically examine the different casts, or rather classes of society, in India, we shall find that their physical powers and appearances are considerably modified by their manner of living. Nothing strikes the stranger with greater astonishment, than the personal contrast between the rich and the poor! Almost the whole of the upper classes are absolutely FALSTAFFS; and often have I been puzzled to know how some of them could stow themselves away in a palankeen, and still more so, how their bearers could trot along under the pressure of such human porpoises! The truth is, that the Hindostanee fops, (and most of the superior orders are such,) pride themselves above all things, on rotundity of corporation, and particularly on the *magnitude of their heads*.

To acquire such elegant distinctions, one would be tempted to suspect, that they occasionally broke the vegetable *regime*, and indulged in better fare than BRAMHA thought proper to prescribe. But no; all is accomplished by *ghee* and indolence! Of the former, which is a kind of semi-liquid butter, made by evaporating the aqueous part from the rich milk of the buffalo, they swill immense quantities; and whatever we may hear, from the *fireside* travellers, of Hindoo temperance and abstemiousness, these gentry contrive to become as *bilious*, occasionally, as their European neighbours, and manage to curtail the natural period of their existence full as efficaciously as their brother “*gourmands*” on this side of the

water—making their exits, too, by the same short routes of apoplexy, and other fashionable near cuts to heaven.

The lower or industrious classes, on the other hand, who live almost exclusively on vegetables, certainly bear a striking resemblance to “Pharaoh’s lean-fleshed kine.” But although they have not the physical strength of a European, they make up for this, in what may be termed “*bottom* ;” for it is well known, that a native will go through three times as much fatigue, under a burning sky, as would kill an Englishman outright—witness the palankeen bearers, coolies, dandies, hircarrahs, &c. Nor is temperance always a prominent feature in the character of these gentry ; for what with bang, toddy, arrack, opium, and other inebriating materials, which all countries produce in some shape or other, and which all nations have shown their ingenuity in manufacturing, they not seldom “muddle their brains,” with as much glee as the same description of people in our own latitudes. Those, on the other hand, who, from local situation, poverty, or principle, adhere to the dictates of their religion and cast with great pertinacity, and seldom admit animal food within the circle of their repast, (milk excepted,) are certainly exempted from numerous ills that await our and their countrymen, who transgress the rules of temperance. Yet, when they are overtaken by disease, they have not *stamina*, and debility characterises the symptoms. Upon the whole, I am inclined to think that, taking the average longevity of all ranks and classes throughout the vast oriental peninsula, the period of human life falls a full *eighth* short of its European range.—But as this does not quadrate with the opinions of speculative philosophers at home, who *will* equalize the age of man all over the world, I shall cite the authority of a very intelligent Officer, whom I have so often quoted before, and who had some twenty years’ acquaintance

with the country in question. "Longevity," says he, "certainly is not characteristic of India. Whether this is owing to the excessive heat, or the indolence of the upper, and drudgery of the lower classes, it may be difficult to decide; but certain it is, that we rarely see an instance of *any one* arriving at sixty years of age."*

From indigenous customs, then, in respect to animal and vegetable food, we can draw no inference that absolutely prohibits the *former*, but enough to convince us, that during the first years of our sojourn between the tropics, we should lean towards the Hindoo model; and as the tone of the constitution becomes lowered, or assimilated, we may safely adopt the Mahomedan manners.

The period of our meals, in hot climates, indeed in all climates, is worthy of notice. Both Hindoo and Mahomedan breakfast early—generally about sunrise. Their early hours cannot be too closely imitated by Europeans. This is a very substantial meal, particularly with the Hindoo; for rarely does he take any thing else till the evening: a custom, in my opinion, that would be very prejudicial to Europeans.—Breakfasts, among the latter, are often productive of more injury than dinners, especially where fish, eggs, ham, &c. are devoured without mercy, as not unfrequently happens. Many a nauseous dose of medicine have I been obliged to swallow, from indulging too freely in these articles; but I saw my error before it was too late. Most people suppose, that as a good appetite in the morning is a sign of health, so they cannot do sufficient honour to the breakfast table; but the stomach, though it may relish, is seldom equal to the digestion of such alimentary substances as those alluded to, where a sound night's rest has hardly ever been procured. I have seen the most unequivocal bad effects from heavy breakfasts, in others, as well as in

* Oriental Field Sports, vol. 1, p. 236.

my own person; and I shall relate one instance that may well serve as a drawback upon the pleasures of a luxurious *déjeunée* in the East. Mr. B—— Purser of a frigate, a gentleman well known on the station, was as determined a *bon vivant* as ever I had the honour of being acquainted with.—“*De mortuis nil nisi verum.*”—He certainly had possessed a most excellent constitution; for I have seen it perform prodigies, and falsify the most confident medical prognostications! He had served many years in the West Indies, where he passed through the usual ordeals of yellow fever, dysentery, &c. with *eclat*; and he came to the East, with the most sovereign contempt for every maxim of the Hygeian goddess! Although he never neglected, even by accident, his daily and nightly libations to the rosy god, yet no sportsman on the Caledonian mountains, could do more justice to a Highland breakfast than he. Indeed, he rarely went to sea, without an ample private stock of epicurian provender; and I have seen him thrown into a violent paroxysm of rage, on finding that two nice-looking hams, which he had purchased in China, resisted all attacks of the knife, in consequence of a certain *ligneous* principle, which “FUKKI” had contrived to substitute, with admirable dexterity, for the more savoury fibres of the porker! The items of the last breakfast which he made, minuted on the spot by a German surgeon who attended him, are now before me. The prominent articles were, four hard-boiled eggs, two dried fishes, two plates of rice, with chillies, condiments, and a proportionate allowance of bread, butter, coffee, &c. Many a time had I seen him indulge in this kind of fare with perfect impunity; but all things have an end, and this proved his final breakfast! He was almost immediately taken ill, and continued several days in the greatest agony imaginable! Notwithstanding all the efforts of the surgeon, no passage downwards could ever be procured till a few

hours before his death, when mortification relaxed all strictures. Let the fate of the dead prove a warning to the living !

The newly arrived European should content himself with plain breakfasts of bread and butter, with tea or coffee; and avoid indulging in meat, fish, eggs, or buttered toast. The latter often occasions rancidity, with nausea at the stomach, and increases the secretion of bile, already in excess. Indeed, a glance at master *Babachee*, buttering our toast with the greasy wing of a fowl, or an old, dirty piece of rag, will have more effect in restraining the consumption of this article, than any didactic precept which I can lay down; and a *picturesque* sight of this kind may be procured any morning, by taking a stroll in the purlieus of the kitchen.

In regard to dinner, Europeans appear of late to study convenience rather than health, by deferring that meal till sunset. This was not the case some forty or fifty years ago; and many families, even now, dine at a much earlier hour, except when tyrant custom and ceremony prevent them. In truth, the modern dinner in India is perfectly superfluous, and too generally hurtful. The *tiffin*, at one o'clock, consisting of light curries, or the like, with a glass or two of wine, and some fruit, is a natural, a necessary, and a salutary repast.—But the gorgeous table—the savoury viands—the stimulating wines of the evening feast, prolonged by the fascination of social converse, greatly exacerbate the nocturnal paroxysm of fever imposed on us by the hand of nature, and break with feverish dreams, the hours which should be dedicated to repose! The consequences resulting from this are quite obvious. It may be observed, that the natives themselves make their principal meal at sunset, when the heat is less distressing, and insects neither so numerous nor teasing; but it must be recollected, that they, in general, eat nothing between

breakfast and dinner ; and that among the Hindoos and lower classes of Mahomedans, &c. the evening meal is by no means of a stimulating quality, while no provocative variety, or other adventitious circumstances, can have much effect in goading the appetite beyond its natural level. Add to this, that in the upper provinces, among Mahomedans of distinction, who can afford more substantial, and animal food, the dinner hour is *one or two o'clock*, and after that, little or nothing, except coffee, sweetmeats or fruit, is taken during the evening.

He, then, who consults his health in the Eastern world, or in any tropical climate, will beware of indulging in this *second* and *unnecessary* dinner, particularly during the period of his probation ; but will rather be satisfied with the meridian repast, as the *principal* meal, when tea or coffee, at six or seven o'clock in the evening, will be found a grateful refreshment. After this, his rest will be as natural and refreshing, as can be expected in such a climate ; and he will rise next morning with infinitely more vigour, than if he had crowned a sumptuous dinner with a bottle of wine the preceding evening. Let but a trial of one week put these directions to the test, and they will be found to have a more substantial foundation than *theory*.

Of supper it is not necessary to speak, as it is a mere matter of ceremony in hot climates, excepting after assemblies, or on some public occasions, which indeed are badly suited to the torrid zone.

A limited indulgence in fruits, during the first year, is prudent. Although I myself never had any reason to believe that they actually occasioned dysentery, yet, where the intestines are *already* in an irritable state, from irregular or vitiated secretions of bile, they certainly tend to increase that irritability, and consequently *predispose* to the complaint in question. Particular kinds of fruit, too, have peculiar effects

on certain constitutions. Thus, *mangoes* have something stimulating and heating in them, of a terebinthinate nature, which not seldom brings out a plentiful crop of pustules, or even boils, on the unseasoned European. A patient of mine, who died from the irritation of an eruption of this kind, had been much addicted to an unrestrained indulgence in fruit, particularly mangoes;—indeed their effect in this way is familiarly known in India. Neither is pine apple, (though very delicious,) the safest fruit to make too free with at first. Good ripe shaddocks are very grateful in hot weather, from their subacid and cooling juice, so well adapted to allay the unpleasant sensation of thirst. Plantains and bananas are wholesome and nutritious, especially when frittered. The spices and condiments of the country, as I before hinted, should be reserved for those ulterior periods of our residence in hot climates, when the tone of the constitution is lowered, and the stomach participates in the general relaxation. They are then safe and salutary.

DRINK.

SEC. III.—I shall not here attempt to prove, that WATER is the simple and salutary beverage designed by Nature for Man, as well as other Animals. In every nation, even the most refined and modern, a great majority appear, by their practice at least, to entertain no such belief. They have, with no small ingenuity, contrived so to medicate the native fountain, that they are always either outstripping, or lagging behind, the placid stream of life! The same magic bowl which, this moment, can raise its votaries into heroes and demi-gods, will, in a few hours, sink them beneath the level of the brute creation!

The moralist and philosopher have long descanted on this theme, with little success; for, until people begin to feel the corporeal effects of intemperance, a deaf ear is turned to the most impressive harangues against that deplorable propensity; and even then, but very few have resolution and fortitude to stem the evil habit! Let us do our duty, however, in conscientiously portraying the effects of drink in a tropical climate.

I have already observed, that the grand secret, or fundamental rule, for preserving health in hot countries, is, "TO KEEP THE BODY COOL." I have also alluded to the strong sympathy that subsists between the skin and several internal organs, as the stomach, liver, and intestinal canal. On this principle, common sense alone would point out the propriety of avoiding heating and stimulating drink, for the same reasons that we endeavour to guard against the high temperature of the climate. But no; a wretched, sensual theory has spread from the vulgar to many in the profession, (who ought to know better,) that since the heat of the climate occasions a profuse perspiration, and consequently renders that discharge the more liable to a sudden check, we are to aid and assist these natural causes by the use of "*gently stimulating liquids*," and, of course, increase those very effects which we pretend to obviate! "A little shrub and water," says Mr. Curtis, (*Diseases of India*), "or Madeira and water, *between meals*, is useful, and in some measure *necessary*, to keep up the tone of the digestive organs, and to supply, [*i. e.* augment,] the waste occasioned by an excessive perspiration," p. 281. I can assure Mr. Curtis that, however *necessary*, this practice might have been thought in his time, (forty years ago,) it is *now* considered not only *unnecessary*, but disgraceful; and that in no respectable circle in the Eastern world, beyond the confines of the "*Punch-house*,"

where no European of character will ever be seen, [especially in Bengal,] is any sangaree, porter-cup, or other “gently stimulating liquid,” made use of “between meals.” And I take this opportunity of informing and warning every *new-comer*, that the very call of “*brandy-shrub-pauny!*” will endanger his being marked as a “*vitandus est*,” and that a perseverance in such habit will inevitably, and very quickly too, exclude him from every estimable circle of his own countrymen, who will not fail to note him as in the high road to ruin!

Nor did these most excellent habits of temperance originate in any medical precepts or admonitions—far from it! The professional adviser was by no means solicitous to inculcate a *doctrine*, which it might not suit his taste to *practise*. But in a vast empire, held by the frail tenure of opinion, and especially where the current of religious prejudices, Brahmin as well as Moslem, ran strong against intoxication, it was soon found necessary, from imperious motives of policy, rather than of health, to discourage every *tendency* towards the acquisition of such dangerous habits. Hence the inebriate was justly considered as not merely culpable in destroying his own health, *individually*, but as deteriorating the European character in the eyes of those natives, whom it was desirable at all times to impress with a deep sense of our superiority. Happily, what was promotive of our *interest*, was preservative of our health, as well as conducive to our happiness; and the general temperance in this respect, which now characterises the Anglo-Asiatic circles of society, as contrasted with Anglo-West-Indian manners, must utterly confound those fine-spun theories, which the votaries of porter-cup, sangaree, and other “gently stimulating liquids,” have invented about—“supporting perspiration,” “keeping up the tone of the digestive organs,” &c. all which *experience* has proved to be not only *ideal*, but *pernicious*! “On the meeting together of a company of

this class," [planters,] says a modern writer on the West Indies, "they were accustomed *invariably*, to sit and continue swilling strong punch, (sometimes half rum,) and smoking segars, till they could neither see nor stand; and he who could swallow the greatest quantity of this *liquid fire*, or infuse in it the greatest quantity of ardent spirits, was considered the cleverest fellow." *Account of Jamaica and its Inhabitants*, 1808.—p. 189. And again: "The inferior orders, in the towns, are by no means exempt from the reproach of intemperance; nor are the more *opulent classes*, generally speaking, *behind hand* in this respect. Sangaree, arrack-punch, and other potations, are pretty *freely drunk*, *early in the day*, in the taverns," p. 199.

I can conceive only one plausible argument which the trans-atlantic Brunonian can adduce, in support of his doctrine after the unwelcome *denouement* which I have brought forward respecting oriental customs; namely, that as the range of atmospheric heat, in the West Indies, is several degrees *below* that of the East, it may be necessary to counterbalance this deficit of *external* heat, by the more assiduous application of *internal* stimulus! For this hint he will no doubt, be much obliged to me, as he must consider the argument irresistible.

I may here remark, that too much praise cannot be given to the Captains of East Indiamen, for the lessons of temperance and decorum that are generally taught on board their ships, (whatever may be the motives,) during the outward bound passage. The very best effects result from this early initiatory discipline, in a thousand different ways. Rarely, indeed, in the vessels alluded to, does the decanter make more than half a dozen tours, (often not so many,) after the cloth is removed at dinner, before the company disperse, by a delicate, but well-known signal, either to take the air upon deck, or amuse themselves with books—chess—music, or the like, till the evening.

After a very frugal supper, the bottle makes a tour or two, when the significant toast of—" *Good night, ladies and gentlemen!*" sends every one at an early hour to repose.

It may readily be conceived, of what incalculable utility five or six months' *regimen* of this kind must prove to Europeans, approaching a tropical climate; especially when policy and imperious custom will enforce its continuance there! It is true, that at each of the presidencies, there may be found several individuals of the old bacchanalian school, whose wit, humour, or vocal powers, are sometimes courted, on particular occasions, to—"set the table in a roar." But let not such expect to mingle in the *domestic* circles of respectable society, (where alone true enjoyment is to be found,) either in the civil or military departments. No such thing as a regimental mess exists in India; and as convivial association thus becomes perfectly optional, the least tendency to inebriety will assuredly *insulate* the individual who, from solitary indulgence and reflection, soon falls a martyr to the baneful effects of **INTEMPERANCE**!

The navy presents a different aspect. Fewer of these have an opportunity of becoming acquainted with the domestic manners either of the natives or Europeans on shore; and therefore, they more frequently pursue their usual course of living, both in food and drink, for a considerable time after arriving on the station; verifying the observation, that—

"*Cœlum non animum mutant qui transmare currunt.*"

And although they are fortunately less exposed, in general, to many of those causes which aggravate the effects of inebriety ashore, yet much injury is produced before they see their error.

A very common opinion prevails, even in the profession,—and I am not prepared to deny its validity, that during the operation of wine or spirits on the human frame, we are better able to resist the agency

of certain morbid causes, as contagion, marsh effluvia, cold, &c. But let it be remembered, that it is only while *the excitement* lasts, that we can hope for any superior degree of immunity from the said noxious agents ; after which, we become doubly disposed towards their reception and operation ! Nor am I fully convinced, by all the stories I have heard or read, that *inebriety* has, in any case or emergency, even a *momentary* superiority over *habitual* temperance.

The delusion in respect to vinous and spirituous potations, in hot climates, is kept up chiefly by this circumstance, that their bad effects are, in reality, not so conspicuous as one would expect ; and they rather predispose to, and aggravate the various causes of disease resulting from climate, than produce direct indisposition themselves ; consequently, superficial observation places their effects to the account of other agents. But the truth is, that as *drunkenness*, in a moral point of view, leads to every vice ; so, in a medical point of view, it accelerates the attack, and renders more difficult the cure of every disease, more particularly the diseases of hot climates ; because it has a *specific* effect, I may say, on those organs to which the deleterious influence of climate is peculiarly directed. If the Northern inebriate is proverbially subject to hepatic derangement, where the coldness of the atmosphere powerfully counterpoises, by its action on the surface, the internal injury induced by strong drink, how can the Anglo-East or West Indian expect to escape, when the external and internal causes run in perfect unison, and promote each other's effects by a wonderful sympathy.

It has been considered wise, as I before hinted, to take the seasoned European for our model, in every thing that respects our *regime* of the non-naturals. "Strangers," says Mr. Curtis, "arriving in India, if they regard the preservation of health, cannot too soon adopt the modes of living followed by the expe-

rienced European residents there." I do not conceive this to be a good medical maxim, even in India, where temperance is scarcely a virtue; and certain I am, that it is a most dangerous precept in the West, for reasons which I have lately rendered sufficiently obvious. It confounds all discrimination between the very different habits of body, which the seasoned and unseasoned possess. It is consonant with experience, as well as theory, that the *former* class may indulge in the luxuries of the table with infinitely less risk than the *latter*; and this should ever be held in view. In short, the nearer we approach to a perfectly *aqueous* regimen in drink, during the first year at least, so much the better chance have we of avoiding sickness; and the more slowly and gradually we deviate from this afterwards, so much the more retentive will we be of that invaluable blessing—HEALTH!

It might appear very reasonable, that in a climate where *ennui* reigns triumphant, and an unaccountable languor pervades both mind and body, we should cheer our drooping spirits with the mirth-inspiring bowl;—a precept which Hafiz has repeatedly enjoined. But Hafiz, though an excellent poet, and like his predecessor, Homer, a votary of Bacchus, was not much of a physician; and without doubt, his "*liquid ruby*," as he calls it, is one of the worst of all prescriptions for a "pensive heart." I remember a gentleman at Prince of Wales's Island, [Mr. S.] some years ago, who was remarkable for his convivial talents and flow of spirits. The first time I happened to be in a large company with him, I attributed his animation and hilarity to the wine, and expected to see them flag, as is usual, when the first effects of the bottle were past off; but I was surprised to find them maintain a uniform level, after many younger heroes had bowed to the rosy god. I now contrived to get near him, and enter into conversation, when he disclosed the secret, by assuring me he had drunk

nothing but water for many years in India; that in consequence his health was excellent—his spirits free—his mental faculties unclouded, although far advanced on time's list: in short, that he could conscientiously recommend the "*antediluvian*" beverage, as he termed it, to every one that sojourned in a tropical climate.

But I am not so *utopian*, as to expect that this salutary example will be generally followed; though it may lead a few to imitate it, till the constitution is naturalized, when the *pleasures of temperance* may probably induce them to persevere. At all events, the new comer should never exceed three or four glasses of wine after dinner, or on any account, admit it to his lips between meals, unless excessive fatigue and thirst render drink indispensable, when cold water might be injurious. Spirits, of course, should be utterly proscribed.

One circumstance, however, should always be kept in mind, to wit, that when a course of temperance is fully entered on, no consideration should induce us to commit an occasional debauch, especially during our seasoning; for we are at those times in infinitely greater danger of endemic attacks, than the habitual bacchanal.

It has been remarked, by many sensible observers, that *acids* are injurious to the stomach and bowels between the tropics. I will not contradict, though I cannot confirm this observation. I never saw any bad effects myself from their use; and I know some medical gentlemen, long resident in India, who drank very freely of sherbet, at all times when thirst was troublesome. Nature seems to point out the vegetable acids, in hot climates, as grateful in allaying drought, and diffusing a coolness from the stomach all over the body. It is very probable, however, that where the alimentary canal is in an irritable state, they may excite diarrhoea; and this last frequently

leads to more serious disturbance in the functions of the digestive organs. Where the tone of the stomach, too, is weak, (as is often the case,) and that organ is disposed to generate acidity, the acids in question may readily prove injurious.

It has also been said, that a too free use of cocoanut water, or milk, as it is sometimes called, has produced bowel complaints. My own observations are not in unison with this remark. It was my favourite beverage, and never did I feel in my own person, or perceive in others, the slightest inconvenience from indulging in this most delicious liquid. It ought, however, to be fresh-drawn, limpid, sweet, and never drunk after the deposit on the inside of the shell begins to assume the form of a consistent crust.

I have alluded to the danger of drinking cold fluids when the body is heated, and particularly where perspiration has continued profuse for any time. I could furnish many instances, illustrative of this position, but shall only adduce the following:—

Lieutenant Britton, of the Royal Marines, (at that time belonging to his Majesty's ship *Grampus*,) a very fine young gentleman, had heated and fatigued himself, by driving about the streets and bazars of Calcutta, in the autumn of 1803, in which state, he had the imprudence to swallow an ice-cream, for the purpose of allaying his thirst. Of the effects of this he died, a few weeks afterwards, on his passage to Madras, under my own care. It brought on inflammation about the fauces, which subsequently spread down along the membrane lining the trachea, to the lungs, producing symptoms exactly resembling croup. He died in dreadful agonies, flying from one part of the ship to another, for relief from the dyspnœa and oppression on his chest. Various remedies were tried, but all in vain. Let this prove a caution to the living! “The danger, says Dr. Dewar, of drinking cold water in that state of the system, was most

“striking when a copious draught was quickly taken
 “after extraordinary heat and fatigue. An acute
 “pain was instantly produced in the stomach, and
 “rapidly extended through the rest of the body which
 “threatened to overpower the whole vigour of the
 “frame.” *On Dysentery*, p. 50. A navy surgeon
 died at Marmorice in Asia Minor, after a very short
 illness contracted by taking a draught of cold water
 in a hot state of body. For numerous examples of a
 similar nature, see Currie’s *Medical Reports*.

EXERCISE, &c.

SEC. IV.—This is one of the luxuries of a northern climate, to which we must, in a great measure, bid adieu, between the tropics. The principal object and effect of exercise in the *former* situation, appear to consist in keeping up a proper balance in the circulation—in supporting the functions of the skin, and promoting the various secretions. But perspiration and certain secretions, (the biliary, for instance,) being already in excess, in equatorial regions, a *perseverance* in our customary European exercises, would prove highly injurious, and often does so, by greatly aggravating the natural effects of climate. Nevertheless, as this *excess* very soon leads to debility and *diminished action*, in the functions alluded to, with a corresponding *inequilibrium* of the blood, so it is necessary to counteract these, by such active or passive exercise as the climate will admit, at *particular periods of the day or year*; a discrimination imperiously demanded, if we mean to preserve our health. Thus, when the sun is near the meridian, for several hours in the day, on the plains of India, not a leaf is seen to move—every animated being retreats under cover—and even the “*adjutant*,” [gigantic crane,] of Ben-

gal, whose stomach will bear an ounce of emetic tartar without complaining, soars out of the reach of the earth's reflected heat, and either perches on the highest pinnacles of lofty buildings, or hovers in the upper regions of the air a scarcely discernible speck. At this time the Hindoo retires, as it were instinctively, to the innermost apartment of his humble shed, where both light and heat are excluded. There he sits quietly, in the midst of his family, regaling himself with cold water or sherbet, while a mild but pretty copious perspiration, flows from every pore, and contributes powerfully to his refrigeration.*

As soon as the cool of the evening, however, commences, all nature becomes suddenly renovated, and both men and animals swarm in myriads from their respective haunts! Then it is, that the esplanade at Calcutta, and the Mount road near Madras, pour on the astonished eye of the stranger a vast assemblage of all nations, casts, and complexions, comprehending an endless and unequalled variety of costume and character, hurrying to and fro, in all kinds of vehicles as well as on foot, enjoying the refreshing air of the evening! The same scene is witnessed early in the morning, particularly during the cool season, in Bengal; but in the rainy season there, and while the hot land-winds prevail on the Coromandel coast, the life of a European is irksome to the last degree! Perspiration being then profuse, the most trifling exertion is followed by languor and lassitude. Cooped up behind a *tatty*, or lolling about under a *punka*, he can neither amuse his mind, nor exercise his body, and *tædium vitæ* reigns uncontrolled during these gloomy periods! It need hardly be urged, how injurious active exercises would be to Europeans, at such times; or indeed, during the heat of the day, at any time.

* What with the smoke of the house, [for there is no chimney,] and the oil on his skin, a native is hardly ever annoyed by mosquitoes, as foreigners are.

Yet hundreds annually perish from this very cause; particularly in the West Indies, after each influx of Europeans during war!

Who would expect to find *dancing* a prominent amusement in a tropical climate? The natives of the West Indies are excessively fond of this exercise; but in the east there are *wise men* still, for instead of dancing themselves, they employ the *nautch-girls* to dance for them.

It might seem ill-natured if I animadverted on the custom of my fair countrywomen, who *show off* with such eclat, at the *Pantheon* in Madras, regardless of all thermometrical indications. The practice is not *salutary*, however *politic* it may be found—and it certainly does not *appear* to agree so well with *married ladies* as with *virgins*, whatever may be the reason.

I have shown that the range of atmospherical heat is considerably higher in the East than in the West, and that in the latter part of the world they are exempted from hot land-winds, and more favoured with cool sea-breezes, than the inhabitants of the former. Still, Europeans, although they may not enjoy better health, experience infinitely less mortality in the peninsula of India, than in the West Indian Archipelago. If a thousand European troops, for instance, are debarked at Kingston, Jamaica, and an equal number at Madras, at the same time, we shall find the former lose, in all probability, one-third—perhaps one-half their number, during the first eighteen months: while the other corps will not lose more than a thirtieth or a fortieth part of their total, in the same period. But if we examine the two bodies of men at the end of five or six years, we shall not find the same disproportion. Hepatic and dysenteric complaints, by that time, will have brought the Eastern corps somewhat nearer a *par* with their Western countrymen. The great *onus* of disease bears on the *first year* of a European's residence in the West In-

dies, because that is the period within which the endemic or yellow fever makes its attack ; after which, he feels the effects of climate in a more moderate degree.—In the East, fever, (excepting in Bengal,) is by no means general ; and the first year is not distinguished by mortality. But the climate being much hotter, and the atmospherical vicissitudes more sudden and extensive, each subsequent year produces great mischief in important organs ; and the wonder is, why he does not suffer infinitely more than the Anglo-West Indian !

I have already adduced several causes for this disparity ; (vide pages 114-15, &c. Vol. I.) one, the greater length of an East India voyage, with its concomitant abstemious regimen, the reverse of which so much predisposes to the violent assaults of the Western endemic. Another, is the laudable temperance and decorum, prescribed by general custom in the Eastern world, obviating, in no slight degree, the deleterious influence of climate. I shall now proceed to make some observations on other differences in the modes of life, and means of preserving health in the two countries, as elucidatory of this subject, hoping that the interest and utility of the discussion will sufficiently excuse its informal position in this section.

First, then, the Houses of the East, whether permanent mansions or temporary *bungalows*, are better calculated for counteracting the heat of the atmosphere than those of the West. As there is no dread of earthquakes or hurricanes, in the former place, the dwellings are *solid*--the apartments lofty--the windows large, and the floors, in general, composed of *tarras*, which being often sprinkled with water, is cool to the feet, and diffuses an agreeable refrigeration through the room. Add to this, that the spacious *verendahs* ward off the glare of the sun, and *reflected* heat, (an important consideration,) by day, and afford a most pleasant retreat in the evening, for enjoying the cool

air. The *tatties*, which are affixed to the doors and other apertures, in the hot season, and kept constantly wet by *bheesties*, or water-carriers, whereby the breeze is cooled by evaporation, in its passage through the humid grass, of which the tatty is constructed, prove a very salutary and grateful defence against the hot land-winds; since this simple expedient makes a difference of twenty or thirty degrees, between the *bheesty's* and the *European's* side of the *tatty*! It appears, however, that in the East we have not been sufficiently attentive to the prevention of *reflected heat and glare*; a circumstance of infinitely greater consequence than the freest ventilation. Let us learn from the native. His habitation has very few apertures, and those high up. His floor, and the inside of the walls, are moistened two or three times a-day, with a solution of *cow-dung in water*, which, however disagreeable to the olfactories of a European, keeps the interior of the dwelling as cool as it is dark. Here he sits on his mat, enjoying his aqueous, but salutary beverage; and with such simple means and materials, counteracts the heat of the climate more effectually than the European, in his superb and costly edifice. "Those who live in houses," says Dr. Winterbottom, "the walls of which are plastered with mud, frequently, during the continuance of hot weather, wet the walls and floor, to cool the air; this is a very *hurtful* practice, as it renders the air *moist*, and brings it nearly into the state it is in during the rainy seasons."—On Hot climates, p. 16. This, like many other observations founded on *contracted* views, and favourite theories, is completely contradicted by the broad basis of facts. It reminds us of a passage in Dr. Robertson's third volume on the Diseases of Seamen, where he undertakes to prove, that it is the *moisture* of the air over marshes that causes disease; and, in short, questions whether *miasmata* ever produced fever—except on board the *WEAZLE* sloop of

war, when he was surgeon of her, on the coast of Africa!!

The upper classes of natives, also, have not been inattentive to the prevention of reflected heat. The houses of Benares, for instance, are of solid stone, and generally six stories high, with small windows. The streets are so extremely narrow, that the sun has very little access to them; obviating thereby the disagreeable effects of glare. The windows are small, because, from the height of the houses it would be impracticable to apply tatties during the hot winds; whereas, in low country-houses, or bungalows, they are large, in order to extend the refrigerating influence of the tatties.

The dazzling whiteness of European houses in India is not only inconvenient, but in some degree injurious, to the eyes, at least; and a verendah, entirely encompassing the mansion, would contribute greatly to the refrigeration of the interior apartments; the most comfortable of which, by the by, on the ground floor, used to be appropriated to the use of palankeens and lumber, but are now wisely converted into offices, &c.

The *punka*, suspended from the lofty ceilings of the Eastern rooms, and kept waving overhead, especially during our repasts, is a very *necessary* piece of what may be fastidiously styled “Asiatic luxury.” Indeed, were it not for this and the *tatty*, some parts of India would be scarcely habitable by Europeans, at certain seasons.

It is observed, in a recent “Account of Jamaica,” by a gentleman long resident there, that the “*Asiatic effeminacy* of being carried about in a palankeen, has not yet reached the West Indies.” It would be well if several other Asiatic effeminacies, [temperance for example,] were more generally adopted in the transatlantic islands. But that the Anglo-West-Indian rejects this luxurious vehicle, *merely* through

any scruple respecting its *effeminacy*, is rather too much for credence. If a dozen of sturdy *balasore-bearers* could be hired in Jamaica for the trifling sum of four or five shillings a-day, including all expenses, the Western Nabob and Nabobees would soon condescend to recline in the palankeens, with as much state as their “*effeminate*” brethren of the East. But the plain reason is, that neither the country itself nor its *imported* population will admit of a conveyance, which is cheap, elegant, and convenient, on the sultry plains of India.*

Gestation in a palankeen, however, is a species of passive exercise exceedingly well adapted to a tropical climate. The languid circulation of the blood in those who have been long resident there, is pointedly evinced by the inclination which every one feels for raising the lower extremities on a parallel with the body, when at rest; and this object is completely attained in the palankeen, which indeed renders it a peculiarly agreeable vehicle. On the same principle we may explain the pleasure and the utility of *shampooing*, where the gentle pressure and friction of a soft hand, over the surface of the body, but particularly the limbs, invigorate the circulation after fatigue, and excite the insensible cuticular secretion. I much wonder that the *sving* is not more used between the tropics. In chronic derangements of the viscera it must be salutary, by its tendency to determine to the surface, and relax the sub-cutaneous vessels, which are generally torpid in those diseases. It might be practised in the evenings and mornings—and within doors, when the state of the weather, or other circumstances, did not permit gestation, or active exercise in the open air.

A propensity towards *smoking* would not be ex-

* Cheeks of kuss-kuss, a sort of grass, of which the *tatties* are made, being affixed to the doors of palankeens, and kept moist, enable Europeans to travel during the hottest weather. A wet *palampore*, or covering of calico, is a tolerable substitute.

pected, *a priori*, in a tropical climate. Yet the practice is very general among Europeans and Natives, and seems to spring from that listlessness and want of mental energy, so predominant in the character both of sojourners and permanent inhabitants of sultry latitudes. As the custom may not be insalutary at certain seasons of the year, in particular places, where marshy or other deleterious exhalations abound; and as it is often a succedaneum for more dangerous indulgences, it is best, perhaps, to pass it over with little comment. Yet it has ever appeared to me a degrading habit, for a gentleman to become a *slave* to his hookah; and it is beyond endurance, to see a great, lusty *hookah-burdaar*, insinuate the pipe of his long *snake* into the delicate hand of a European lady, after dinner, who plies the machine with as much glee, as the sable and subordinate nymph of the country does her *nereaul*! For the honour and delicacy of the sex, this practice is by no means common; and the wonder is, that it ever should have existed.

In the article of *dress*, the Anglo-East Indians have a manifest advantage over those of the West. The delicious and salutary beverage of *cool drink*, too, is more in use among the former than the latter; partly owing to custom, and partly to opulence, which enables all ranks of Europeans to have their wine, water, &c. refrigerated with saltpetre, by a particular servant, set apart for that sole purpose, and called in Bengal—*Aub-daar*. The effect of these gelid potations on the stomach is diffused from thence, by sympathy, over the whole frame, but especially over the external surface of the body, counteracting in no mean degree, the natural influence of the climate. It is true, the bottles are brought on table in the West Indies, enveloped in wetted napkins; but the effect is far inferior to that produced by the nitrous solution; and as the *aub-daar*'s art is extended to all kinds of drink, this grateful luxury is ever at hand.

BATHING.

SEC. V.—“I dare not,” says Dr. Moseley, “recommend cold bathing, [in the West Indies;] it is death with intemperance, and dangerous where there is any fault in the viscera. It is a luxury denied to *almost all*, except the sober and abstemious females, who well know the delight and advantage of it,”—3d ed. p. 90. In respect to its being “death with intemperance,” I believe that numerous inebriates could tell the doctor a different story; but, as it is presumed he never deigns to look into a modern author, he is unacquainted with various facts that militate against his dogma. The well-known instance of Mr. Weeks, of Jamaica, who always went to sleep in cold water, when intoxicated, is sufficiently in point. Many a time have I seen it bring the drunken sailor to his senses at once; and *invariably* have I observed it to moderate the excitement of spirituous potations. I knew a gentleman who always went to sleep with his head on a *wet swab*, whenever he had taken a good “*mosquito dose*;” and the consequence was, that he very seldom complained of head-ache next day. It is true, that if the cold bath be injudiciously used, during the indirect debility *succeeding* a debauch, there may not be sufficient energy in the constitution to bring on re-action; and then, of course, it would be injurious. But this is a discrimination to which the genius of a Moseley could not stoop. Granting, however, what is certainly true, that the cold bath is dangerous, where visceral obstructions obtain, I cannot conceive why it should be denied to *almost all*, except females, in hot climates; unless we take those visceral derangements with us from Europe. Surely we might be allowed “the delight and advantage” of it, till these disordered states occur!

But whatever *theory* may have discouraged bathing,

and recommended the use of "gently stimulating liquids," in the West; wide *experience* has completely settled these points, long ago, in the East. There, the Native and European—the old and the young—the male and the female, resort to the BATH, as the greatest luxury, and the best preservative of health. In truth, it is one of the most powerful engines we possess, for counteracting the destructive influence of a hot climate, because it connects the most grateful sensations with the most salutary effects—it is indeed both *utile et dulce*.

Nature, or instinct itself, points out the external application of cold water to the body, to moderate the action of atmospheric heat. The buffalo is a familiar example. In the middle or hot period of the day, these animals repair to pools or marshes, and, wading in, either stand or lie down there, with every part except the nose immersed in water; or, where there is not water, in the mud. At these times, by the by, it is very dangerous for Europeans to approach their haunts. They generally start up all at once, on being disturbed; and if one or two begin to snort and advance, the European is in imminent peril: nothing but the most rapid retreat to a place of safety, can secure his life. A red coat is a very unfortunate dress at such critical rencontres, as the animals in question have a decided antipathy to that colour.

It requires but little penetration to see, that the Brahminical injunctions, relating to ablutions, were founded on the preservation of *present* health to the body; though the *future* happiness of the soul was artfully held out as a superior inducement to the performance of these ceremonies, so necessary beneath a burning sky. The superstitious Hindoo rarely omits bathing, once or oftener, every day, in the sacred stream of the Ganges, [or other consecrated river,] from which he is not deterred even by the vo-

racious alligator, who frequently carries him off in the religious act! He generally wades out to a moderate depth—then, shutting his eyes, and putting his fingers in his ears, he squats himself under water two or three times—washes his *doty*—and returns, cool and contented, to his humble cot.

The Europeans and upper classes of Mahomedans, however, feeling no great desire for risking *tete-a-tetes* with sharks or alligators, are, in general, satisfied with a few pots of cold water thrown over their heads, at home, once, twice, or oftener every day, according to the season of the year, and the person's own inclinations. This, being unattended either with fatigue or expense, is well adapted to all circumstances and situations, and answers the end in view effectually enough.

I have shown, in various parts of this essay, that most of the diseases of tropical climates are attributable to *atmospherical vicissitudes*. Now, there is nothing that steels the human frame, with more certainty, against the effects of these, than the cold bath. We are the very creatures of habit; and, consequently, *habitation* is the surest prophylactic. The cold bath not only counteracts the influence of heat, by suspending its operation for the time, but it safely inures us to the sudden application of cold, the fruitful source of so many disorders. By keeping the skin clean, cool, and soft, it moderates excessive, and supports a natural and equable cuticular discharge; and from the "*cutaneo-hepatic sympathy*," so often noticed, the functions of the liver partake of this salutary equilibrium—a circumstance hitherto overlooked.—The use of the *cold bath*, then, should be regularly and daily persevered in, from the moment we enter the tropics; and when, from long residence there, the functions above alluded to begin to be irregular and defective, instead of in excess, we may prudently veer round, by degrees, to the *tepid bath*, which will

be found a most valuable part of 'Tropical Hygiene among the *seasoned* Europeans.

As the cold bath is passive, (for it is seldom that the exhausting exertion of swimming accompanies it,) so it may be used at any period of the day; though the mornings and evenings are generally selected by Europeans in the East; immediately after leaving their couch and before dinner. The bath is very refreshing, when we rise unrecruited from a bad night's rest; and powerfully obviates that train of nervous symptoms, so universally complained of by our countrymen between the tropics. Before dinner it is salutary, apparently from that connexion which subsists between the external surface and the stomach, in consequence of which the tone of the latter is increased, and the disagreeable sensation of thirst removed, that might otherwise induce to too much potation during the repast.—It is, however, imprudent to bathe while the process of digestion is going on in the stomach, as it disturbs that important operation. Where visceral derangements of any extent, particularly in the liver, have taken place, the cold bath must be hazardous, from the sudden afflux of blood directed from the surface to the interior, and also on account of the subsequent vascular reaction. The tepid bath, taking care to avoid a chill afterwards, will, in these cases, be substituted with great advantage.



SLEEP.

SEC. VI.—When we bid adieu to the temperate skies of Europe, with all its “long nights of revelry,” and enter the tropics, particularly in the Eastern hemisphere, we may calculate in a great falling off in this “solace of our woes.” The disturbed repose, which we almost always experience there, has a

greater influence on our constitutions than is generally imagined, notwithstanding the silence of authors on this subject. Nature will not be cozened with impunity. Whatever we detract from the period of our natural sleep, will assuredly be deducted in the end, from the natural range of our existence, independently of the predisposition to disease, which is thus perpetually generated. This is a melancholy reflection; but it is truth, and it should induce us to exert our rational faculties in obviating the evil.

When the sun withdraws his beams, and the intense heat of the atmosphere is mitigated, we might expect a comfortable interval of repose—but this would be a vain hope. A new host of foes instantly appear in arms to annoy us! mosquitoes, ants, and cock-roaches, lead on the insect tribes—the bat wheels in aerial circuits over our heads, on which he sometimes condescends to alight, without ceremony—while the snake patrols about, in the purlieus of our apartment: coils himself up under our beds, or even deigns to become our *bedfellow* without waiting the formality of an invitation!*

The great object of a European is to *sleep cool*. This enables him to procure more rest than he otherwise could do; and by giving his frame a respite, as it were, from the great stimulus of heat, imparts to it a tone and vigour—or as Dr. Darwin would say, “an accumulation of excitability,” so necessary to meet the exhaustion of the ensuing day, as well as to repair that of the preceding.

A great waste of strength—indeed, of life, arises from our inability, on many accounts, to obtain this

* Many instances have occurred of snakes being found coiled away between children in bed. It is said, that if a chaffing dish, filled with clear, live embers, be quietly placed on the floor of a room, in such emergency, the reptiles will repair to it; especially if some new milk be also left near the chaffing-dish—Great presence of mind is here necessary, in order not to disturb those dangerous creatures suddenly in their retreat.

cool repose at night. Thus rains, heavy dews, or exhalations from contiguous marshes, woods or jungles, often render it unsafe or impossible to *sleep in the open air*; a practice fraught with the most beneficial consequences, where the above mentioned obstacles do not prevent its execution. But, pending the hot and dry season in Bengal, and almost always on the Coromandel coast, except during the hot land-winds, or at the change of the monsoons, we may indulge, not only with safety, but with infinite advantage, in the seemingly dangerous luxury of sleeping abroad in the open air.

I am well aware of the prejudices entertained against this custom, by great numbers, both in and out of the profession; but I am convinced, from personal experience and observation, that the practice, under the specified restrictions, is highly salutary, and I know it is sanctioned by some of the best-informed veterans, who have spent most part of their lives between the tropics. Speaking on this subject, the judicious Captain Williamson remarks that—"few, very few instances could be adduced, of any serious indisposition having attended it; while, on the other hand, it is confessed by all who have adopted it, that the greatest refreshment has ever resulted; enabling them to rise early, divested of that most distressing lassitude, attendant upon sleeping in an apartment absolutely communicating a febrile sensation, and peculiarly oppressive to the lungs."—*East India Vade-Mecum*.

If it be observed, that I have all along held up to view the danger of atmospherical vicissitudes, to which this practice would *apparently* expose us; I answer, that I have also maintained, that *early habituation* to these was the surest preservative against their injurious effects, as exemplified in the use of the bath. The truth is, however, that while the custom of sleeping in the open air steels the human frame against

these same effects, it is, in reality, attended with less exposure to sudden *atmospherical transitions* than the opposite plan. Nature is ever indulgent when we observe her ways, and obey her dictates. Excepting the periods and places alluded to, the *transition in the open air*, from the scorching heat of the day to the cool serenity of night, is gradual and easy. To this the human frame bends with safety, and we sink into a grateful and sound sleep, that renovates every corporeal and mental faculty. Whereas, those who exclude themselves from the breath of heaven, whether from necessity or inclination, become languid, from the *continued* operation of heat, and the want of repose; in consequence of which, the slightest aerial vicissitude, (either from leaving their couch, or admitting a partial current of cool air, which they are often compelled to do,) unhinges the tenor of their health, and deranges the functions of important organs! These are they, who require the afternoon *siesta*, and to whom, indeed, it is necessary, on account of the abridged refreshment and sleep of the night; while the others are able to go through the avocations of the day, without any such substitute—a great and manifest advantage.

Indigenous custom is, generally speaking, in favour of sleeping in the open air, during the hot seasons, in most Eastern countries. The practice, indeed, is less adopted in Bengal, for very obvious reasons, than on the Coromandel coast; but the Native sleeps much cooler, at all times, than the European, from this circumstance—that his bed seldom consists of more than a *mat*, while a piece of *calico* wrapped round him, supplies the place of bed clothes. The more closely we imitate these the better will it be for us. Indeed, a thin hair mattress, with a sheet and palampore, are the only requisites, independently of the thin gauze or mosquito curtains, which defend us from insects, and, when we sleep out on the *cha-*

bootah, arrest any particles of moisture that may be floating in the atmosphere. Early hours are here indispensable. The fashionable nocturnal dissipation of Europe would soon cut the thread of our existence between the tropics. The order of nature is never inverted with impunity, in the most temperate climates; beneath the torrid zone, it is certain destruction. The hour of retirement to repose should never be protracted beyond ten o'clock; and at day-light we should start from our couch, to enjoy the cool, the fragrant, and salubrious breath of morn.

We shall conclude this section with a few remarks on Incubus, or Night-mare—a very troublesome visitor to a tropical couch.

The *proximate cause* of Incubus has given rise to various speculations. A very general opinion prevails that this affection is produced by mechanical obstruction to the blood's circulation, from particular position of the body. It is a certain fact, however, that no posture is a security from night-mare among the predisposed; neither is a full stomach to be accused as the cause, nor an empty one to be expected as the antidote of this disorder. There is, however, an almost universal opinion, that incubus attacks persons *only* while on their backs! and this opinion *seems* to have some foundation in fact, from the following circumstances. One of the symptoms almost inseparable from the disease is this, that the patient *appears to himself* to be kept down upon the back by some external force; and as, at the moment of recovering the power of volition, a great confusion of ideas prevails, a person may easily imagine that he has recovered himself by some effort of his own, by turning from his back to his side. But these things are extremely fallacious, as there is no trusting to the senses during a paroxysm of incubus.

It appears, however, from the mode of treatment to which this disease gives way, that the primary

cause, in whatever manner it may act, has its seat in the digestive organs, and that night-mare originates in defective digestion, whereby the food which should be converted into good chyle, is transformed into a half-digested mass of *acid* matter, which is productive of heart-burn, eructations, flatulence, gripes, with the whole train of dyspeptic and hypocondriacal complaints.

There are many stomachs which convert every thing they receive instantly into an acid; and such will be generally found to be the case with persons subject to habitual night-mare, or frightful dreams and disturbed sleep. Such stomachs are too frequently distended with some acid gas, which alone gives rise, in many cases, to paroxysms of incubus; and may often be instantly removed by any warm cordial, as peppermint, gin, brandy, carbonate of ammonia, &c. Whytt used generally to take a small wine-glassful of brandy going to bed, in order to keep off night-mare and terrific dreams to which he was very subject.

Of all medicines, however, the carbonate of soda, taken in a little ale or porter, as recommended by Mr. Waller, will be found the most efficacious. About a scruple, going to bed, is a sufficient dose; and where acidities prevail in the stomach, the same quantity, twice in the day will be useful. This medicine not only neutralizes any acid in the first passages, but likewise brings away by stool, vast quantities of viscid slimy matter, so acrid as to burn and excoriate the parts it touches. The appetite now generally improves; but the propensity to acidify remains for a long time in the stomach, and requires great attention to diet and regimen. There are few people with whom particular kinds of food do not disagree, and these being known should be avoided. Thus chesnuts or sour wine will almost always produce incubus among those predisposed to it, as was

observed by Hildanus. "*Qui scire cupit quid sit Incubus? Is ante somnum comedat castaneas, et superbibat vinum fœculentum.*" In this country, cucumbers, nuts, apples, and flatulent kinds of food, are the articles most likely to bring on night-mare.

The following draught I have found very efficacious in preventing attacks of incubus, viz. carbonate of ammonia, ten grains, compound tincture of cardamoms, three drachms, cinnamon water, two ounces, to be taken going to bed.

Intemperance of any kind is hurtful. Most vegetables disagree; and pastry, fat, greasy, and salted meat, are to be avoided. Moderate exercise is as beneficial, as sedentary employments, intense study, and late hours are prejudicial.

THE PASSIONS.

SEC. VII.—I have not yet alluded to the conduct of the Passions, because most of the precepts that apply to the regulation of them in cold climates, will be equally applicable here. But I may be permitted to correct an erroneous, (I think,) though very general opinion, that there is something peculiar in a tropical climate, which excites certain passions in a higher degree than in temperate regions. "There is," says Dr. Moseley, "in the inhabitants of hot climates, unless present sickness has an absolute control over the body, a promptitude and bias to pleasure, and an alienation from serious thought and deep reflection. The brilliancy of the skies, and the beauty of the atmosphere, conspire to influence the nerves against philosophy and her frigid tenets, and forbid their practice among the children of the sun,"—p. 87. This is a very superficial, and a very false view of the affair. It is likewise a very immoral one; for it

furnishes the dissolute libertine with a *physical* excuse for his debaucheries, when the real source may be traced to relaxation of religious and moral principles! I would ask Dr. Moseley to explain the reason why, if the "*promptitude to pleasure*" be increased in a hot climate, the *ability* to pursue or practise it should be lessened?—a truth well known to every debauchee.

If the prevalence of polygamy in warm climates be adduced, I answer, that in countries where plurality of women is allowed, a minute and accurate investigation will show, that among the lower orders of people the licence of the prophet is an empty compliment, for *they* find one wife quite enough. And as for the *higher ranks* of society, there is not *one in twenty* who has more than one wife, nor one in five hundred who has more than two. If we compare this last part of the statement with the picture of life in the *beau monde* at home, we shall not have much reason to congratulate ourselves on the great *physical continence* resulting from our gloomy skies, as contrasted with the "*bias to pleasure*" which springs from levity of atmosphere between the tropics.

May we not attribute the premature decay of Native women in hot climates, to the long-established custom of early marriages in that sex, originally introduced by the despotism of man, but which has now effected an actual degeneracy in the female part of the creation. "It is a disgrace to a woman not to be married before twenty years of age; and we often see wives, with children at their breasts as soon as they enter their teens." I have no doubt that, to the continued operation of this cause, through a long series of centuries, is owing the deterioration in question; for it is not conformable to the known wisdom of the Creator, that such an inequality should *naturally* exist between the sexes.

But to return. The removal of religious and moral restraint—the temptations to vice—the facility

of the means, and the force of example, are the real causes of this "bias to pleasure;" and in respect to the *effects* of licentious indulgencies between the tropics, I can assure my reader, that he will find, probably when it is too late, how much more dangerous and destructive they are than in Europe.

He now has explained to him the nature of this "propensity;" and as the principal cause resides neither in the air, nor the "brilliancy of the skies," but in his own breast, he has no excuse for permitting it to sprout into the wild luxuriance of unbridled excess.

The monotony of life, and the apathy of mind, so conspicuous among Europeans in hot climates, together with the obstacles to matrimony, too often lead to vicious and immoral connexions with Native females, which speedily sap the foundation of principles imbibed in early youth, and involve a train of consequences, not seldom embarrassing, if not embittering every subsequent period of life! It is here that a taste for some of the more refined and elegant species of literature, will prove an invaluable acquisition for dispelling *ennui*, the moth of mind and body.

END OF VOLUME II.

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